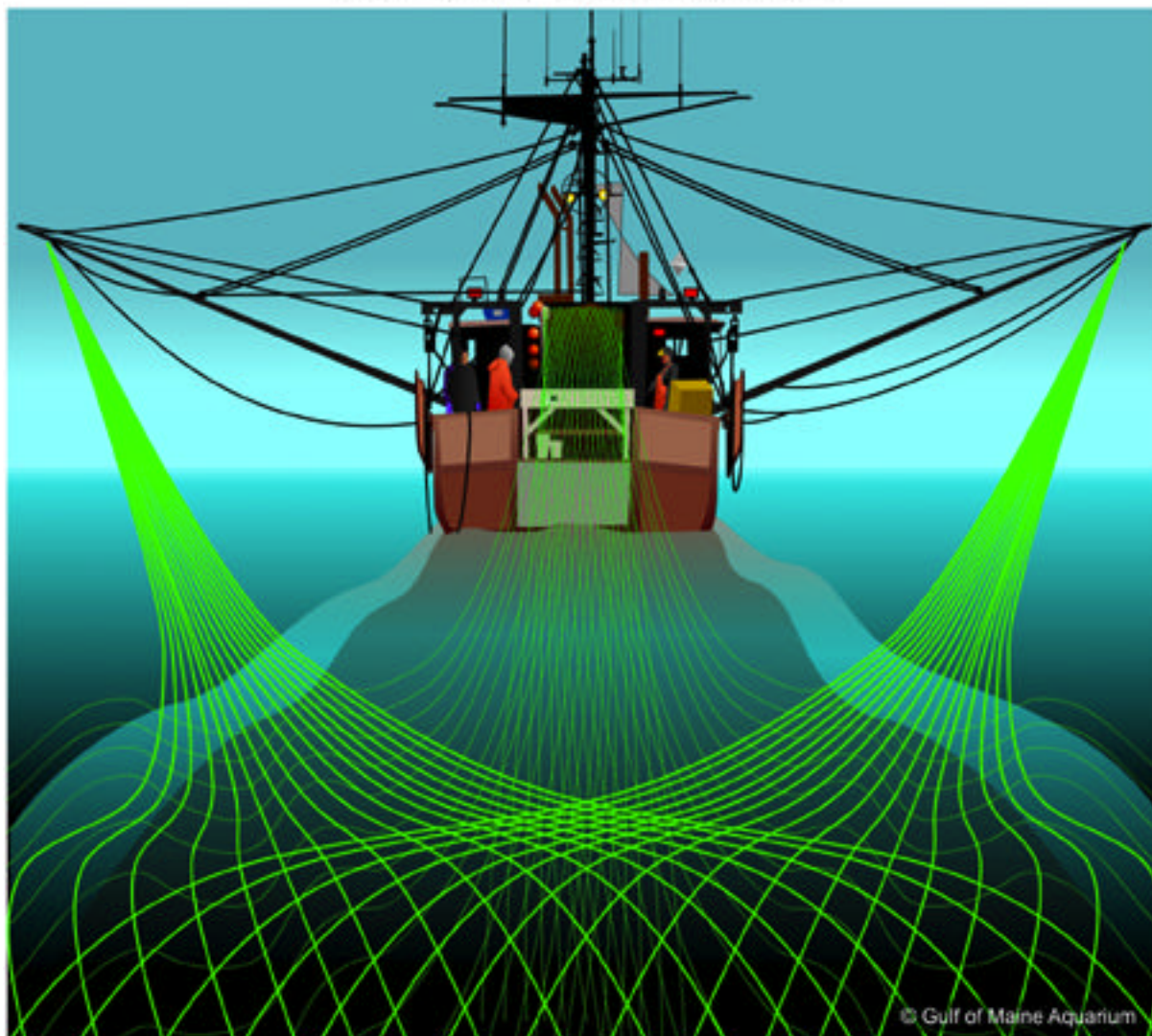


# IMPLEMENTING AN INDUSTRY-BASED SURVEY PILOT FLEET IN NEW ENGLAND



RECOMMENDATIONS FROM THE INDUSTRY-BASED SURVEY COMMITTEE  
CONVENED BY THE NATIONAL MARINE FISHERIES SERVICE

**MARCH 2002**

Report Produced by the  
Gulf of Maine Aquarium  
Portland, Maine

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## Acknowledgements

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Fisheries management issues are complex and multifaceted as are the people that are working to sustain these fisheries. This report is the result of a group of dedicated people, fishermen, scientists and managers, who came together to explore a collaborative way to begin resolving the scientific questions around groundfish management. All of these people are involved in many aspects of fisheries issues with many demands on their time. Their dedication and commitment to this project speaks to the genuine desire to forge partnerships and develop sustainable fisheries through cooperative research. We thank you for your efforts!

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Cover art by C. Michael Lewis.

## **Background**

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In 2000, the National Marine Fisheries Service (NMFS) was allocated \$15 million by Congress as New England groundfish disaster relief funds to be used for cooperative research efforts. The New England Fisheries Management Council's Research Steering Committee and NMFS assessed the needs in the region and determined that the primary focus of the funds should be to establish an industry-based study fleet, an industry-based survey fleet, a cod tagging program and gear modification research. In late 2000 and early 2001, NMFS commissioned a series of scoping meetings to discuss these four topics. A two-day workshop was held in April 2001 to further explore the details of industry-based cooperative research fleets (see the NMFS web site for a copy of these reports - <http://www.nero.nmfs.gov/ro/doc/da.htm>). As a result of these meetings, an Industry-based Survey Fleet Committee was established. The Industry-based Survey Fleet Committee (IBS Committee) was tasked with designing a pilot industry-based program for New England groundfish species. The goal of the IBS Committee was to clearly define the objectives, implementation strategy and budget for a pilot survey project or projects to serve as a starting point for the development of an industry-based survey fleet.

## **Introduction**

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The Industry-based Survey Fleet Committee met five times from August 2001 to March 2002. The diversity of interests among the Committee members and the complexity of the issues being discussed demanded a series of all-day meetings as well as sub-committee discussions. Over the course of the meetings, the Committee wrestled between the desire for long-term monitoring of Gulf of Maine and southern New England groundfish stocks to augment the current assessments versus short-term projects that would focus on issues of groundfish distribution in the Gulf of Maine, particularly the closed areas, and/or yellowtail assessment in southern New England. Throughout the meetings, the committee raised concerns about the long-term commitment of NMFS to support industry-based surveys and the need for consistent program funding for collaborative research by Congress. We encourage you to read the meeting minutes in the Appendix for a detailed summary of the discussions at the meetings.

There was also concern among the IBS Committee about the need to integrate any additional data gained through the pilot projects with current NMFS data. In particular, the Committee wanted to avoid "dueling assessments" between the NMFS trawl survey and the industry-based survey. The IBS Committee felt that the focus should be on the quality of the research. NMFS typically uses other sources of information in assessments to compliment their information. The IBS Committee viewed the industry-based survey as a great opportunity to provide supplemental information and guarded against replicating information that is already available. It was acknowledged that the NMFS trawl survey has a broad, coast-wide picture and a higher resolution of near shore sampling would greatly enhance the stock assessment information. The pilot

projects for the industry-based survey, therefore, are focused on different species-specific objectives instead of the more broad-based objectives of the NMFS trawl survey.

## **Goal and Objectives**

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The IBS Committee seeks to achieve the following long-term goal and objectives for the New England Industry-based Survey:

### ***Goal -***

To determine the spatial and temporal distribution patterns of key resource species to inform the design, implementation and evaluation (pre/during/post) of management measures to protect these species in meeting fishery management goals.

### ***Objectives –***

- To expand data collection for fisheries management in the Northeast through the use of scientifically designed industry-based surveys.
- To develop partnerships and promote understanding among scientists and the fishing industry by joining traditional knowledge of fishermen and scientific expertise.
- To obtain fine-scale information on distribution and demographics of key fish stocks.
- To increase public understanding of the benefits and success of cooperative research between industry, scientists and managers working together to sustain the fisheries.

### ***Outcomes –***

The Industry-based Survey Pilot Projects aim to achieve the following:

- 1) Provide timely information for evaluation of resource status and the development of sustainable fishing practices.
- 2) Develop information on demographics and distribution of Gulf of Maine cod and southern New England yellowtail stocks.
- 3) Provide cost effective research platforms, while expanding the pool of vessels involved in and increasing the capacity for special purpose research, within the Gulf of Maine and southern New England.
- 4) Promote cooperation and reduce conflict between fishermen and managers by providing opportunities for jointly collected and shared data.
- 5) Coordinate with other cooperative research efforts (e.g., cod tagging projects).

A pilot, by definition, is a test of concept to learn what works and what does not work. After the pilot phase of the industry-based survey, NMFS plans to fully implement the IBS Program.

## Report Format

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This report outlines a framework for the National Marine Fisheries Service to consider when implementing the industry-based survey with the above long-term goals and objectives in mind. The first part of the report outlines several issues and concerns raised by the IBS Committee in their discussions about implementing a successful industry-based survey effort. These are important issues that will need to be considered to implement successful industry-based survey pilot projects.

The following section describes the two industry-based pilot projects recommended, cod distribution in the Gulf of Maine and an assessment of yellowtail flounder in southern New England, including survey design and estimated project budget for each project. The Committee considers both projects to be important to assess the health of groundfish fisheries in New England. The final section of the report suggests an implementation strategy for the pilot projects, including oversight and management. The minutes from each of the meetings as well as other supplemental information are included in the appendices.

## Issues and Concerns to Consider in Developing A Successful Industry-based Survey

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### Outreach

Outreach is a critical component to the success of the industry-based survey pilot projects. The outreach strategy should include multiple target audiences. First, the draft design and implementation for both pilot projects should be discussed with industry members at local port meetings to work through the survey details with broad industry input. This should include several meetings to extend cooperation for the pilot projects beyond the IBS Committee. Genuine industry involvement is the most important component for the industry-based survey pilot projects to achieve the goals of breaking down barriers, forging new partnerships, promoting cooperation, and reducing future conflicts.

The second target audience for outreach includes Congress and environmental interests. The industry-based survey pilot projects are part of a broader effort in New England to develop and implement collaborative research projects among fishermen and scientists who have traditionally been seen as adversaries. By integrating the scientific knowledge of researchers with the practical insights of fishermen, the outcome is a true partnership and mutual understanding of the information. These collaborative research efforts will facilitate cooperative management in New England. Congress has been generous in their endorsement and support of this approach. These pilot projects will build on past successful cooperative research projects and need to be shared with those in Congress who continue to support these efforts. In addition, as environmental advocacy organizations continue to play an increasingly active role in fisheries management issues in New England, these stakeholder groups should be included in any outreach strategy.

Finally, information about the proposed pilot projects and the benefits of collaborative research in New England needs to be effectively communicated to the popular press. The focus of reporting on fishing issues has been on the contentious management decisions and disagreements among fishermen, scientists, managers and environmentalists. Collaborative research efforts shine a light on a new era of cooperation and information sharing and break down old stereotypes. It is valuable for the public to learn how fisheries science and management is evolving in the 21<sup>st</sup> century.

### Local Knowledge

The issue of how to involve more vessels and fishermen with local knowledge was discussed at great length within the IBS Committee. The suggestion was made to consider putting together a team of fishermen who don't have qualifying boats for the pilot projects and use them for observing, data collection, and to provide local knowledge. For example, in the Maine/New Hampshire trawl survey, local fishermen are compensated \$200/day for coming aboard the vessel to share their local knowledge

about a particular piece of ground. This has worked well to garner information, cultivate local support and identify owners of fixed gear. The IBS Committee expressed their desire to bring other fishermen aboard survey vessels to get more people involved with the pilot projects and share local knowledge. It was also suggested that exchanges among vessels from various parts of the Gulf of Maine and southern New England would be extremely valuable for communication among fishermen throughout the whole region. This would allow fishermen in different areas to see and appreciate the way others fish and support research.

## **Data Availability**

The IBS Committee viewed the need for rapid turnaround of data as an integral component to any successful industry-based survey project. Too often, fisheries data is difficult to access by fishermen and others. Although the IBS Committee was concerned about replicating current efforts by creating a new data-clearing house, it felt that the industry-based survey pilot projects should make the data available to the industry and others in a short period of time. Some Committee members called for immediate release of the data (real-time), while others cautioned that data should be reviewed for accuracy before being made public.

The IBS Committee recommended that the survey data be made available on the web and include GIS-based formatting designed upfront. Pre-design templates should be created to input data and display distribution maps easily and quickly in a web-based format with queries of key areas of interest pre-determined from the fishermen. An initial quality control should take place after each survey cruise after which a sub-set of the data should be made available to address the most commonly asked questions from the fishing industry about the project. Other data would be further refined and analyzed. In addition, the Committee discussed using the Study Fleet electronic data solution as the model for the industry-based survey data collection.

The concerns about speed of data turnaround, access and availability can be addressed by: (1) defining with industry the information to be made available through web published survey results; (2) funding upfront programming of database that will accept vessel data, provide for rapid data validation, format vessel data for immediate export to GIS-based data display published to web, and format website to accept highest priority industry queries; (3) providing quick display of preliminary data results once validated; and (4) archiving data with NMFS. Raw data would be accessible after data had been audited and corrected without analysis.

It was also suggested that cooperation with fishermen should be at both the analytical level as well as the data collection level. The data elements that NMFS, MA and ME/NH trawl surveys already use should be part of the survey data elements and the IBS Committee suggested using the NMFS data template so the data could be archived at NMFS. A table of the data collected from the NMFS and state surveys is included in the Appendix. In addition to these data elements it was suggested that eventually physical



factors such tides, moon phase, weather, etc. be included in data reporting with both predicted and actual observations.

## **Random Stratified Design**

During the course of the meetings the IBS Committee had several discussions about conducting a random stratified survey and the concerns some industry members have about the validity of such surveys because they miss known areas with pockets of fish. The industry members advocated for a better understanding of what fish are doing on a finer scale with some flexibility in conducting the tow along cod bottom to chase an edge instead of a straight line. At times, there was disagreement among industry and science members about the best sampling design. The NMFS survey design is consistent over a long period of time within a broad area in order to provide abundance indexes that can be compounded from year to year. Changing the methodology to use knowledge of fishermen would bias the results of the survey. In addition, NMFS is not interested in going solely to areas of high fish concentrations because these “core areas” where fish are likely to be found have contracted and therefore do not provide a complete picture of the status of the resource.

The Canadian Sentinel Survey includes random stratified and 20 fishermen-selected sites (Alain Fréchet, pers. comm.). Fishermen in the past have been confused that some of the survey sites are in areas where they wouldn't expect to find fish. However, now the “core areas” in Canada are shrinking and fishermen have an easier time understanding sampling in areas that may not currently have fish. The IBS Committee determined that a mix of random stratified samples with fixed stations is the appropriate design for the industry-based survey. This design will require area-specific input to determine industry's areas of particular concern and define industry-selected stations.

## **Multiple Gear Types**

The initial desire of the IBS Committee was to include multiple gear types to involve a broad spectrum of the fishing industry in the survey. However, over the course of the Committee's discussions, the utility of using gillnets and hooks to collect the data for the pilot projects was seen as impractical. Although it was not the ideal approach, the IBS Committee agreed that the use of a single gear type would simplify implementation of the initial pilot projects. It is important with a multi-vessel industry survey that the vessels and their gear be as similar as possible, with sufficient calibration tows, so that differences are due to biology, not vessel or gear effects. It was noted that the Study Fleet effort will include multiple gear types and provide an opportunity for broader industry involvement in these collaborative efforts.

## **Permitting**

The IBS Committee expressed concerns about the length of time for the current experimental permitting process and the hindrance this places on any research projects. Although it was recognized that NMFS is looking at streamlining the permit process by

having all cooperative research programs under one pre-approved NEPA document, the IBS Committee was still concerned about the ability for any pilot projects to move through the permitting process. The NMFS staff are also putting together an experimental permit packet to describe the process and discussing how Environmental Impact Statement stipulations could be worked out at the proposal level, earlier in the process. The IBS Committee also shared specific concerns about the willingness of NMFS to permit activities in closed areas, which are a key interest of Committee members. Committee members asked NMFS to clarify the feasibility of inclusion of closed areas in survey design.

## **Vessel Compensation**

The IBS Committee felt that compensation should be tied to results, not effort. Current methods for compensating vessels for research work varies widely among projects and the Committee advocated for development of a standardized approach. The industry members of the IBS Committee view vessel participation as “fishing for data” instead of fishing for fish. With this in mind, a nearshore vessel should not be compensated for bad weather days just as it would not earn revenue on days stuck in port due to bad weather days. Offshore vessels, however, should be compensated for weather days due to the inefficiency of returning to port. Compensation should also reflect the opportunity cost of not fishing. For example, the price for the charter should change over the year depending upon the fish that could have been caught during that time period. It was also pointed out that the wear and tear on gear may be greater during research cruises because more and shorter hauls are made than on a typical fishing trip. Concerns were also voiced about fishing in unknown areas (hard/rock bottom) under a random stratified design, where vessels are more likely to tear gear. Many inshore areas have substantial amounts of fixed gear and abandoned gear, which mobile gear fishermen may encounter, causing net damage and down time. The same is true of any management area closed to groundfish gear that has now become primarily a fixed gear area.

## **Sale of Catch**

The IBS Committee raised the issue of selling the catch from a research survey without being penalized for a commercial fishing day-at-sea. The Committee felt strongly that the catch should be taken ashore in order to avoid the wasteful discard of fish caught during research tows, although the difficulties in managing the sale were acknowledged. The IBS Committee recommended designing a standard policy to allow for the sale of catch from industry-based survey projects without using a day-at-sea. The proceeds from any such sale would be used to pay for the cost of industry-based survey projects and would not benefit participants' vessels. This approach would eliminate any incentive for participants to alter their research practices to increase their catch of fish. Without establishing such a policy, it will be difficult for vessels to participate in the industry-based survey if they are required to use a day-at-sea. If this is the case, the vessel charter rate will need to increase dramatically to offset the opportunity cost of using a day-at-sea for research instead of commercial fishing.

In addition to establishing a policy to exempt fishing vessels from using a day-at-sea for research, the Committee also discussed the implications of conducting research in fisheries that have a total allowable catch (TAC). If the TAC is reached, the industry-based survey vessels will need a special permit to land fish in excess of the TAC. The Committee suggested creating a special allocation for research (i.e., research set-asides) or establishing a policy to allow research vessels to exceed the TAC.

## **Training**

The IBS Committee also discussed training issues for vessels and the need for participants to understand the difference in interpretation of fishing vessel data and research vessel data. A standardized training program is needed for the pilot projects to include things such as fish handling techniques, data input, etc. In the Canadian Sentinel Program, the fishermen involved in the sentinel survey meet periodically to discuss the survey results and have additional training sessions. Therefore, the training for participating vessel crew members and observers should be considered an on-going need. This will be critical if crew is used to assist the observers in collection of samples and for the industry participants to be more intimately involved in the pilot projects. One suggestion was to award the vessel contract for work contingent upon completion of training.

It was noted by the IBS Committee that there is currently an educational program for fishermen being developed by University of New Hampshire under a Northeast Consortium grant. An advisory board of fishermen, academics and others are guiding the project that will include two 3-day models to cover 1) fishery science and 2) fishery management. The training will be designed for 15 fishermen and 5 others. This program may be one model to explore when looking at the training needs for the industry-based survey.

## **Other Projects of Merit**

There are other project ideas that were raised during the course of the IBS Committee's discussions that did not fall within the scope of the industry-based survey, but were considered important projects to support. One of these projects included a gear selectivity study to reduce yellowtail by-catch and allow fishing for other species to continue in management areas of the SNE area. The project is a raised footrope trawl experiment and would result in a product in short term to share with industry and Congress. The Committee agreed that the raised footrope experiment was an essential project to get funded and believe it is worthy of getting funding elsewhere as a gear study.

Development of an industry-based survey fleet in New England provides great opportunities for ancillary studies as well as the initial pilot projects. The IBS Committee suggested encouraging funding for other projects that use the vessel time and data under the industry-based survey pilot projects. Such ancillary projects may include

identifying physical characteristics of cod such as body shape and color to differentiate stocks. Stomach samples and otolith samples could also be collected if extra funding is available to analyze the additional information.

## **Recommended Pilot Projects**

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### ***Industry-based Survey for Gulf of Maine Cod Distribution***

#### **Project Background:**

Atlantic cod (*Gadus morhua*) have been commercially exploited in the Gulf of Maine (GOM) since the 17<sup>th</sup> century (NEFSC, 2000). During the past few decades, landings of GOM saw an increase beginning in 1964 and averaged 12,200 mt per year during 1976-1985. Landings had reached 17,800 mt in 1991, the highest since the early 1900s and decreased sharply to 10,891 mt in 1992. According to the most recent stock assessment (SAW 33), the total landings of Gulf of Maine cod equaled 4,156 metric tons (mt) in 1998, declined to 1,636 mt in 1999, and increase to 3,730 mt in 2000.

The GOM cod fishery is managed under the Northeast Multi-species Fishery Management Plan (FMP) by the New England Fishery Management Council (NEFMC). Beginning with the implementation of Amendment 5 in 1994, the primary goal of the FMP became a reduction in fishing mortality for five key monitoring stocks (GOM and Georges Bank cod, haddock, southern New England yellowtail, and Gulf of Maine yellowtail). Initially, the reduction was to be achieved through a reduction in the days at sea usage (NEFSC, 2000). Under Amendment 7, a series of seasonal and year-round closures were implemented as well. (See appendix for a brief history of the NEFMC closed areas). The seasonal or rolling closures were designed to reduce the catch of fish and to limit harvest at critical times of the year, such as during spawning. The utility of the rolling closures has not been evaluated.

The severe restrictions on fishing in recent years have led to a call for more species-specific information to supplement the current NMFS trawl survey. Although NMFS and the Massachusetts Division of Marine Fisheries (DMF) each conduct long-term monitoring programs in the Gulf of Maine, there are still large gaps in information, particularly in the inshore waters off Maine and New Hampshire where the key spawning aggregations are known to occur, as well as mid-range waters off Massachusetts between 3-12 nautical miles from shore. Spring and fall bottom trawl surveys for finfish resources have been conducted in offshore continental shelf waters from Cape Hatteras, NC to Nova Scotia, including the Gulf of Maine, by the NMFS since 1963. However, the rough terrain that characterizes the bottom of the nearshore areas of northern Gulf of Maine and the abundance of fixed gear in inshore waters has severely limited the number stations in the strata <100 meters (Sowles et al., 2001). The lack of fishery-independent survey data from historically important fishing grounds has led to significant gaps in information needed to assess current stock conditions and develop effective management strategies. Recently, however, a public-private partnership within the States of Maine and New Hampshire initiated an inshore multi-species stock assessment within the waters of Maine and New Hampshire (see Appendix for a map of the spring 2001 survey stations for the NMFS, Massachusetts and Maine/New Hampshire surveys).

With less than about 20% of the US portion of the Gulf of Maine inshore waters routinely surveyed, the impact of the rolling closures on the Gulf of Maine cod stocks is difficult to assess. The focus of the industry-based pilot survey is on surveying aggregations of cod in time and space to describe cod distribution by stock demographic characteristics (age structure, spawning, and variance) and develop an aggregation map. This survey of cod distribution is needed to monitor inshore cod stocks, assess the importance of these areas as nursery and spawning grounds, and to improve management decisions. The survey will obtain more detailed information about cod than is currently available from the existing surveys and help refine the description of future closures in space and time.

### **Project Objective:**

To define a broad scale distribution of cod aggregations in the Gulf of Maine, in space and time, by age and size composition.

### **Project Purpose:**

- To complement NMFS, states and other surveys to characterize cod distribution.
- To contribute to filling the gaps in time and space that are inherent in NMFS and state surveys and improve robustness of stock assessment for cod.
- To collect information on stock demographics (age structure and spawning condition) of cod.
- To investigate the association of cod with other species in time and space.
- To provide opportunities for complementary projects to take advantage of ancillary cruise information.
- To move toward the development of an optimal survey design for cod.

### **Project Deliverables:**

- Physical, biological, and environmental data to help assess the status of GOM cod stocks.
- A series of maps, charts and graphs in time and space describing cod distribution by stock demographic characteristics (age structure, spawning condition, and variance) in a GIS-based format.
- A web-based data reporting and retrieval system for timely preliminary information dissemination to fishermen, scientists, managers and the public.
- Digital still and digital video images of the survey.

## Project Study Design:

### *Location:*

- *Gulf of Maine waters from shore within 41° 30'N to the Hague Line up to a depth of 60 fathoms (including Cashes Ledge but not including Georges Bank).*

### *Time Periods:*

- January/February – to capture the latest year class
- Late February/Early March - to capture migrating and spawning cod in southern GOM
- Late March/Early April – to capture migrating and spawning cod in mid-coast GOM
- Late April/Early May – to capture migrating and spawning cod in eastern GOM
- Late November/Early December – to capture cod after redistribution of thermocline when spawning aggregations are forming

*Justification:* The design is focused on capturing the aggregations (spawning, juveniles) of fish when they occur. These sampling times will result in high-resolution information throughout the year, with more sampling during the rolling closures.

### *Sampling Design:*

- Random-stratified survey with targeted adjustments to accommodate areas of particular concern to industry based on local discussions. The sampling strata will be determined through workshops with fishermen.
- Four vessels per cruise for 10 days
- 1/2 hour tows; average 5 tows per day (minimum of 4 stations/day, possible 6-7 depending on proximity and weather with an average of 5 stations)
- 200 tows per cruise over six time periods for a total of 1200 stations per year
- Calibration for four vessels: 60 days of calibration per year (10 days/vessel x 2 vessels per pair x 3 pairs)

### *Vessel Criteria:*

- Four 50-65 foot vessels; 1 captain/ 2 crew minimum
  - Six bunks
  - Deck space
  - Experience – documented landings history with local experience
- Project will supply standardized gear.

## Project Staffing:

### Contractor -

- Shore-side Project Manager (including outreach and training)
- Data Entry and Validation Clerk
- Observers (two per vessel). This could included a trained sea sampler and extra crew member as observer.

### NMFS/NFSC -

- Technician for aging (1/2 yellowtail samples and 1/2 cod samples)



## ***Industry-based Survey to Evaluate Southern New England/Mid-Atlantic Yellowtail Flounder***

### **Project Background:**

In 1994, the NEFMC voted to close two substantial fishing areas, the Nantucket Lightship (NLS) and Closed Area II on Georges Bank for yellowtail protection. The NLS area was closed in response to industry reports of large juvenile year classes being discarded, which was verified through intensive sea sampling. Yellowtail flounder have demonstrated the ability to quickly rebuild from low stock sizes in areas such as the Grand Bank and Georges Bank (Walsh et al., 2001; Stone et al., 2001). In contrast, the Nantucket Lightship area has apparently provided no benefit in renewed recruitment of southern New England yellowtail (Cadrin, 2001). NMFS trawl survey data indicates an increase in average size and weight per tow, suggesting that the dominant increase in biomass is growth, rather than recruitment.

Yellowtail flounder (*Limanda ferrugineus*) are currently managed under the Northeast Multispecies Management Plan for groundfish species. The plan is in year five of a rebuilding process, and significant improvements of some groundfish species have been achieved. However, the yellowtail stock remains overfished in the southern New England (SNE) area. SNE yellowtail landings declined from 514mt in 1993 to 271mt in 1997. Landings have since rebounded to 754mt in 2000; however, recruitment indices in the NMFS trawl survey remain low.

The 1999 biomass is estimated at 7-11% of the target biomass of 61,500mt. According to the latest assessment by the Multispecies Monitoring Committee (2001), stock status has not changed. Spawning stock biomass (SSB) of yellowtail flounder remains low, well below the Amendment 7 target and SSB is extremely low compared to historic biomass. The Multispecies Monitoring Committee recommended that fishing mortality (F) should be as close to zero as practicable for the foreseeable future. With  $F=0.0$ , it is estimated the stock would be rebuilt by 2009. The New England Fishery Management Council Plan Development Team previously recommended that in order to rebuild SNE yellowtail stocks, there must be a 50-70% reduction in fishing mortality from the current level. Widespread closures have been identified as one measure for achieving rebuilding targets, and the Plan Development Team has identified three thirty-minute blocks for potential year round closure to rebuild SNE yellowtail stocks.

While the NLS area has not provided any apparent benefit to SNE yellowtail recruitment, Closed Area II has shown significant increases in yellowtail biomass. Prior to implementation of additional closed areas for SNE yellowtail, the NLS area needs to be re-evaluated for abundance, size, distribution, and predator species that may have displaced yellowtail stocks; oceanographic conditions that favor larval retention; and the expansion of fixed gear within the area. This information will assist in refining geographic boundaries of the NLS area to accomplish the original objective of protecting yellowtail flounder and yellowtail habitat.

In addition to the need to evaluate the NLS area, there has not been a comprehensive yellowtail assessment since 1998. Virtual population analysis (VPA) has been used to assess SNE yellowtail since 1988 (NEFC, 1989). However, the VPA could not be updated in 2000 because of inadequate sampling (Murawski et al., 2002). The SNE yellowtail stock has been difficult to sample in recent years because most commercial yellowtail landed in US ports have been caught on Georges Bank or the Cape Cod grounds. In addition, routine NMFS trawl surveys in recent years have not caught enough individual yellowtail for accurate estimates of abundance. Generally, less than five fish per tow have been caught in the NMFS trawl survey since 1990 south of Georges Bank (Murawski et al., 2002). Although initiatives are underway to improve sampling of SNE yellowtail, traditional VPA methods require several years of adequate sampling to produce reliable estimates of stock size.

Observations from the fishing industry indicate yellowtail have become increasingly abundant with varying year classes and an increase in the female to male ratio. Because there is no sea sampling coverage to corroborate these observations, it is critical that a large scale study of the SNE / Mid-Atlantic yellowtail be conducted to inform future management decisions. This pilot project will be used to derive precise estimates of abundance of SNE yellowtail at age using intense sampling with relatively efficient “flatfish” trawls. These estimates can also be used to calibrate future age-based stock assessment using statistical catch-at-age models. Updated information on spatial distribution of yellowtail will also be available from this pilot project to evaluate current and future closed areas. Finally, the tagging component of this pilot project will allow estimation of rate of movement relative to proposed closed areas and yellowtail stocks in the Mid-Atlantic.

#### **Project Objective:**

To assess the abundance, distribution, movement patterns and size/age composition of SNE yellowtail (and associated species) temporally and spatially within the Nantucket Lightship closed area, proposed closed areas and adjacent areas.

#### **Project Purpose:**

- To complement NMFS survey to characterize yellowtail distribution.
- To fill the gaps in time/space that are inherent in NMFS and state surveys.
- To collect information on stock demographics (age structure and spawning condition) of yellowtail.
- To provide opportunities for complementary projects to take advantage of ancillary cruise information.
- To begin long term monitoring of recruitment, increasing the sampling when a large year-class is detected.
- To provide a swept area biomass accounting for efficiency.
- To evaluate general patterns of movement and factors (temperature, depth) associated with yellowtail movements, including movement between adjacent putative stock areas and in and out of the Nantucket Lightship closed area

## Project Deliverables:

- Data to assess the health of yellowtail stocks in southern New England.
- A series of maps, charts and tables in time and space describing yellowtail distribution by stock demographic characteristics (age structure, spawning, and variance).
- Tagging/recapture information over an extended period of time.
- Estimation of yellowtail biomass and the variance around that estimate.

## Project Study Design:

### *Location:*

- *Statistical areas 526/539/537/611/613/616 not to exceed 50 fathoms.*

### *Time:*

- Spring and fall months, following the current NMFS trawl survey (April/November).

### *Sampling Design:*

- Non-proportional allocation:
  - Random stratified (strata to be determined through workshop with fishermen to identify coordinates) (~ 50%)
  - Fishermen Identified Sites (~50%)(Partly industry selected stations and partly stratified-random; percentages to be negotiated. Discuss locations/grids/plots, etc. with the fishermen through workshops.)
- 1/2 hour tows; average 10 tows per day
- 150 tows per vessel/season
  - 100 tows/vessel/season
  - 50 tows/vessel/season as extra tows for calibration and depletion studies

### *Vessel Criteria:*

#### Survey:

- Two vessels over 80 feet; 1 captain/ 3 crew minimum; inter-calibrated for survey.
- Eight bunks
- Deck space
- Sensors
- Experience – documented landings history with local experience
- Vessel supplies standardized gear in bid
- Thirty days each cruise (spring and fall). (15 days per vessel)

**Tagging:**

- One vessel 60 feet to 70 feet; 1 captain/ 2 crew.
- Vessel should be equipped with a flatfish net. Specialized gear is not necessary.
- Twenty-eight days per year.

**Project Staffing:**

**Contractor -**

- Shore-side Project Manager (including data analysis, outreach and training)
- Data Entry and Validation Clerk (part-time)
- Observers (four per vessel). This may included some NMFS sea sampling staff.

**NMFS/NFSC -**

- Technician for aging (1/2 yellowtail samples and 1/2 cod samples)

## Estimated Pilot Project Budgets

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## Gulf of Maine Cod Pilot Project Budget

### Project Management/Data Expenses:

				Year One	Year Two	Comments
NMFS/NFSC -	FTE					
Technician (for aging)	0.5	32,250		16,125	16,125	(Position shared with yellowtail project for aging analysis)
Contractor Staff -						
Project Manager	1	45,000		45,000	45,000	(Includes outreach and training responsibilities.)
Data Analyst	1	37,500		37,500	37,500	
Data Entry and Validation Clerk	1	30,000		30,000	30,000	
Fringe		24%		27,000	27,000	
Observer Insurance Coverage		5,000		5,000	5,000	(Annual fee to employer to insure observers at sea.
<b>Subtotal</b>				<u>\$144,500</u>	<u>\$144,500</u>	
Contractor Expenses -						
Design and Develop GIS-based Data Display				75,000	25,000	(Shared with yellowtail project; format validated vessel data for immediate export to GIS-based display published to the web.)
Travel	12	1500	0.335	6,030	6,030	(12 months @1500 miles/month)
Outreach Materials				3,500	3,500	(Developing and printing brochures, flyers, reports, etc.)
Laptops	4	3,000		12,000	0	
<b>Subtotal</b>				<u>\$96,530</u>	<u>\$34,530</u>	
Overhead	32%	5%		53,640	50,540	(32% of personnel and other expenses (may range from 25% to 40%); 5% of capital expenses (may range from 0% to 25%).)
<b>Total Project Management Expenses</b>				<u><u>\$310,795</u></u>	<u><u>\$245,695</u></u>	

### Survey Vessels Expenses:

January/February	#	Days	Rate			
Vessels (nearshore stations - 80%)	4	8	2,900	92,800	92,800	(Four vessels 50-65 feet; daily charter rate varies with nearshore and offshore cruise tracks)
Vessels (offshore stations - 20%)	4	2	3,500	28,000	28,000	(Offshore work requires more fuel, etc. and increases the daily rate.)
Observers	8	10	300	24,000	24,000	(Two per vessel. One may be trained crew member.)
Overhead			5%	7,240	7,240	(Vessel contract administrative cost.)
<b>Subtotal</b>				<u>\$152,040</u>	<u>\$152,040</u>	
February/March	#	Days	Rate			
Vessels (nearshore stations - 80%)	4	8	2,900	92,800	92,800	
Vessels (offshore stations - 20%)	4	2	3,500	28,000	28,000	
Observers	8	10	300	24,000	24,000	
Overhead			5%	7,240	7,240	
<b>Subtotal</b>				<u>\$152,040</u>	<u>\$152,040</u>	
March/April	#	Days	Rate			
Vessels (nearshore stations - 80%)	4	8	2,900	92,800	92,800	
Vessels (offshore stations - 20%)	4	2	3,500	28,000	28,000	
Observers	8	10	300	24,000	24,000	
Overhead			5%	7,240	7,240	
<b>Subtotal</b>				<u>\$152,040</u>	<u>\$152,040</u>	

## Gulf of Maine Cod Pilot Project Budget

April/May	#	Days	Rate			
Vessels (nearshore stations - 80%)	4	8	2,900	92,800	92,800	
Vessels (offshore stations - 20%)	4	2	3,500	28,000	28,000	
Observers	8	10	300	24,000	24,000	
Overhead			5%	7,240	7,240	
<b>Subtotal</b>				<u>\$152,040</u>	<u>\$152,040</u>	
Nov/Dec	#	Days	Rate			
Vessels (nearshore stations - 80%)	4	8	2,900	92,800	92,800	
Vessels (offshore stations - 20%)	4	2	3,500	28,000	28,000	
Observers	8	10	300	24,000	24,000	
Overhead			5%	7,240	7,240	
<b>Subtotal</b>				<u>\$152,040</u>	<u>\$152,040</u>	
Equipment/Gear:						
Trawl Doors	4		4,000	16,000	0	(#7.5 bison doors; weigh less than other doors and therefore have less impact on the bottom.)
Survey Trawls	6		9,000	54,000	0	(Net, liner, legs and associated hardware.; two extra sets for backup)
Net mending twine and repairs	4		5,000	20,000	20,000	(Regular vessel gear wear and tear maintenance costs.; estimated at \$1,000 per vessel per trip.)
Scales	4		10,000	40,000	0	
Inclinometer	4		1,000	4,000	0	
Thermistors	4	3	100	1,200	0	(3 per vessel @100)
Miscellaneous Observer Supplies	4		2,000	8,000	8,000	(Scale envelopes, forceps, knives, measuring boards, log sheets, etc.)
Overhead			5%	7,160	1,400	
				<u>\$150,360</u>	<u>\$29,400</u>	
Calibration Tows	# of vessel pairs 6	10	2,900	\$174,000	\$174,000	(Four vessels with six vessel pairs.)
Contingency Days		20	2900	\$58,000	\$58,000	(Reserve for unexpected weather and/or gear down time.)
<b>Total Survey Vessels Expenses</b>				<u><u>\$1,142,560</u></u>	<u><u>\$1,021,600</u></u>	
<b>Total Gulf of Maine Cod Pilot Project:</b>				<u><u>\$1,453,355</u></u>	<u><u>\$1,325,295</u></u>	
<b>Two Year Budget:</b>						<u><u><u>\$2,778,649</u></u></u>

## Southern New England Yellowtail Pilot Project Budget

### Project Management/Data Expenses:

			Year One	Year Two	Comments
NMFS/NFSC -					
Technician (for aging)/ Tag Contact	Staff Time	0.5	32,250	16,125	16,125 (Position shared with cod project.)
Contract Staff -					
Project Manager/Data Analyst	1	45,000	45,000	45,000	(Includes preliminary data analysis, outreach and training responsibilities.)
Data Entry and Validation Clerk	0.5	30,000	15,000	15,000	
Fringe		24%	14,400	14,400	
Subtotal			\$74,400	\$74,400	
Contract Expenses -					
Design and Develop GIS-based Data Display			0	0	(See cod project budget.)
Travel	12	1000	0.335	4,020	(12 months @1000 miles/month)
Outreach Materials			3,500	3,500	(Developing and printing brochures, flyers, reports, etc.)
Laptops	3	3,000	9,000	0	(Two for survey work; One for tagging work.)
Subtotal			\$16,520	\$7,520	
Overhead	32%	5%	26,664	26,214	(32% of personnel and other expenses (may range from 25% to 40%); 5% of capital expenses (may range from 0% to 25%).)
Total Project Management Expenses			\$133,709	\$124,259	

### Survey Vessels Expenses:

Fall Survey	#	Days	Rate			
Vessels (two 80 ft. vessels)	2	15	5,000	150,000	150,000	(Includes gear and food supplied by vessel and vessel insurance costs. Calibration tows are included in the 15 days allocated per vessel.) (Includes insurance costs; Four observers per vessel) (Vessel contract administrative cost.)
Observers	8	15	400	48,000	48,000	
Overhead			5%	9,900	9,900	
Subtotal				<u>\$207,900</u>	<u>\$207,900</u>	
Spring Survey	#	Days	Rate			
Vessels (two 80 ft. vessels)	2	15	5,000	150,000	150,000	(Includes gear and food supplied by vessel and vessel insurance costs. Calibration tows are included in the 15 days allocated per vessel.) (Includes insurance costs; Four observers per vessel) (Vessel contract administrative cost.)
Observers	8	15	400	48,000	48,000	
Overhead			5%	9,900	9,900	
Subtotal				<u>\$207,900</u>	<u>\$207,900</u>	



## Southern New England Yellowtail Pilot Project Budget

### Equipment/Gear:

Liners/bag	2	4	2,000	16,000	16,000	(Four per vessel @ 2000)
Maintenance (belly's/twine/doors)	2		3,000	6,000	6,000	(Regular vessel gear wear and tear maintenance costs.)
Life rafts	2		4,500	9,000	0	(Extra life raft needed for observers.)
VMS Support Messaging	2		2,000	4,000	0	
Scales	2		10,000	20,000	0	
Inclinometer	2		1,000	2,000	0	
Thermistors	2	3	100	600	0	(Three per vessel @100)
Miscellaneous Observer Supplies	2		2,000	4,000	4,000	(Scale envelopes, forceps, knives, measuring boards, log sheets, etc.)
Overhead			5%	<u>3,080</u>	<u>1,300</u>	
				\$64,680	\$27,300	
Contingency Days	2	10	5,000	\$100,000	\$100,000	(Reserve days for unexpected weather, gear down time, tear up etc.)
Gear Replacement Fund				\$25,000	\$25,000	(Provisional gear replacement funds for lost gear.)
<b>Total Survey Vessels Expenses</b>				<u><u>\$605,480</u></u>	<u><u>\$568,100</u></u>	

### Tagging Vessel Expenses:

<b>Vessel Costs:</b>	<b>#</b>	<b>Days</b>	<b>Rate</b>			
Vessel (60 ft. to 70 ft.)	1	28	4,000	112,000	112,000	(Includes flatfish net and food supplied by vessel.)
Observers	2	28	400	22,400	22,400	(Includes insurance costs.)
Overhead			5%	<u>6,720</u>	<u>6,720</u>	(Vessel contract administrative cost.)
Subtotal				\$141,120	\$141,120	
<b>Equipment:</b>						
VMS Support Messaging				2,000	0	
Peterson Tags	20,000		0.25	5,000	5,000	
Archival Tags	100		100	10,000	10,000	
Button Tags	2000		17	34,000	34,000	
Miscellaneous Observer Supplies				<u>1,000</u>	<u>1,000</u>	
				\$52,000	\$50,000	
<b>Total Tagging Vessel Expenses</b>				<u><u>\$193,120</u></u>	<u><u>\$191,120</u></u>	

### Total Southern New England Yellowtail Pilot Project:

\$932,309      \$883,479

### *Two Year Budget:*

\$1,815,789

# Pilot Project Implementation

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## Project Management

The IBS Committee concluded that the industry-based survey will need two shore-side project managers, one for the Gulf of Maine cod pilot project and one for the southern New England yellowtail pilot project. Because the industry-based survey initiative evolved from efforts of the states, the IBS Committee felt that the project management should reside at the state level within a local state agency, non-profit or other type of organization. The shore-side managers should be solicited through a request for proposals and be responsible for all aspects of project management including: project planning and execution, vessel contracts, observer and crew training, project outreach, data entry and project finances. Specific tasks for the shore-side managers are outlined below.

### Vessel Selection and Oversight -

- Solicit Vessels: Develop vessel RFP or other method of vessel recruitment based on specific criteria (size, gear, maintenance, expertise, commitment, etc.). Develop contract terms to sustain long-term commitment (incentives to stay involved vs. penalties for dropping out).
- Purchase equipment for vessels.
- Oversee trawl calibrations.
- Manage inter-calibration issues among vessels: size of net, size of mesh, length of spreaders, length of cables, size of cookies, power, towing speed, set and haul back rates, method and paired tow requirements to maintain vessels' calibration.
- Train fishermen in the collection of biological and environmental data.
- Oversee vessel performance and survey implementation.

### Observer Selection and Training -

- Hire and train observers/samplers to work with crew assisting on deck for each survey. Crew from the fishing industry should be encouraged to become trained and participate as observers.
- Conduct regular debriefings, evaluation, and feedback of observers.

### Data Entry and Management -

- Conduct local port meetings to consult with fishermen about pilot project design and implementation.
- Oversee data entry and quality control including data audit procedures.
- Provide quick display of preliminary data results once validated.
- Produce data summaries and communicate results to scientists, managers, and the fishing industry via the web, meetings and other outreach efforts.
- Archive data with NMFS (and with ACCSP when a fisheries independent module is developed).

## Data Management and Display

The Committee discussed at length the desire for rapid display of the information from both industry-based survey pilot projects. (See page 5 under Data Availability for a review of the issues and concerns raised.) To facilitate presentation of data, the Committee recommended creating a GIS-based data template to post data on the web. (See example websites: <http://www.osl.gc.ca/en/peches-sentinelles/accueil.htm> and [http://www.gomoos.org/buoy/buoy\\_data.php](http://www.gomoos.org/buoy/buoy_data.php)) The information would be validated prior to display and would address the most immediate questions of the fishing community. Further analysis after posting the data would be necessary and the information would be presented within this context. The GIS-based data template could be created by the shore-side manager or under another contract. The tasks would include the following:

- Survey industry to determine what specific information they want through web published survey results;
- Develop web-based data display template;
- Design database that will accept vessel data and provide for rapid data validation; and
- Format vessel data for immediate export to GIS-based data display published to web and design website to accept highest priority industry queries.

## Project Oversight

In addition to the shore-side managers, the IBS Committee recommended creating an Implementation Committee to provide supervision of the industry-based survey efforts. The Industry-based Survey Implementation Committee should be staffed by the NMFS Office of Cooperative Programs Coordination and include the following:

- 1 member of the New England Fishery Management Research Steering Committee
- 1 member of the National Marine Fisheries Service Northeast Fisheries Science Center
- 2 members from Rhode Island (one industry member and one state member)
- 2 members from Massachusetts (one industry member and one state member)
- 2 members from New Hampshire (one industry member and one state member)
- 2 members from Maine (one industry member and one state member)
- 1 member from the environmental or non-profit sector

The role of the Implementation Committee should be as an advisory board for the industry-based survey pilot projects. In addition, the Implementation Committee should be forecasting future project needs and providing communication and outreach with others about the value of industry-based survey efforts. The Implementation Committee should serve as a conduit for information about the industry-based survey pilot projects and support the integration of the survey results into the management process.

The Industry-based Survey Implementation Committee should meet as needed with the shore-side project managers to review the implementation of the industry-based survey pilot projects. The shore-side project managers should provide monthly updates on the

progress of the pilot projects to the Implementation Committee. The Implementation Committee should also be responsible for an annual evaluation of the industry-based survey and communication of the evaluation to NMFS and Congress.

The National Marine Fisheries Service should have contractual oversight of the shore-side project managers. Although the Implementation Committee will provide advice regarding implementation of the industry-based survey pilot projects, NMFS has the responsibility and authority for coordinating the pilot projects and addressing any formal concerns about contract obligations including performance measures. The IBS Committee also suggested that the technical review of the industry-based survey pilot projects be conducted through the SARC process or other technical review committee with fishing industry members participating.

## **Recommended Plan of Action**

### ***Implementation:***

1. Solicit proposals for Shore-side Project Manager for Cod Pilot Project and Yellowtail Pilot project.
2. Develop and implement an IBS public outreach plan.
3. Appoint an Industry-based Survey Implementation Committee.
4. Solicit proposals for Programmer to develop data management system - data processing, storage, analysis, and distribution.
5. Actively involve industry in review (vs. as passive observers) of survey analysis/results as part of NMFS review process following survey period.

## References

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Cadrin, S.X. 2001. Southern New England yellowtail flounder. NMFS/NEFSC Woods Hole Laboratory Ref. Doc. 01-20: 54-66.

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Johnson, D.L., W.M. Wallace, P.L. Berrien, and J.J. Vitaliano. 1999. Essential Fish Habitat Source Document: Yellowtail Flounder, *Limanda ferrugiunea*, Life History and Habitat Characteristics. NMFS/NEFSC, James J. Howard Marine Science Lab. NOAA Technical Memorandum NMFS-NE-140.

Mayo, R.K. 2001 Gulf of Maine Cod. In Assessment of 19 Northeast Groundfish Stocks through 2000 – A Report to the New England Fisheries Management Council's Multi-Species Monitoring Committee. NMFS/NEFSC, Woods Hole Laboratory Ref. Doc. 01-20: 80-98.

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NEFSC (Northeast Fisheries Science Center). 2000. 33rd Northeast Regional Stock Assessment Workshop (33rd SAW) Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NMFS/NEFSC, Woods Hole Laboratory Ref. Doc. 01-18: 7-18.

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Stone, H., C. Legault, S. Cadrin, S. Gavaris, J. Neilson, and P. Perley. Stock assessment of Georges Bank (5Zjmnh) yellowtail flounder for 2001. Canada DFO Res. Doc. 2001/068.

Walsh, S.J., M.J. Morgan, D. Power, and C. Darby. 2001. The complete 2001 assessment of Grand Bank yellowtail flounder stock in NAFO Divisions 3LNO. NAFO SCR Doc. 01/76.

### Canadian Sentinel Survey Web Sites:

Fish, Food and Allied Workers - <http://www.ffaw.nf.ca/frameset.html>

Fishermen and Scientists Research Society - <http://www.fsrs.ns.ca/>

SeaLane - [http://sealane.nwafc.nf.ca/sealane/Divisions/Aquatic\\_Resources/Sections/Fisheries\\_Interactions/index.html](http://sealane.nwafc.nf.ca/sealane/Divisions/Aquatic_Resources/Sections/Fisheries_Interactions/index.html)

St. Lawrence Observatory – <http://www.osl.gc.ca/en/peches-sentinelles/accueil.htm>

## **Appendix A:**

### **A Brief History of New England Fishery Management Council Closed Areas**

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Patricia Fiorelli, New England Fishery Management Council

#### **Year-Round Closures:**

##### ***Areas I and II***

Closed primarily to protect spawning haddock (Area I initially a seasonal closure from Feb. 1 – May 31). Historically, Area II closure period was determined by the NMFS Regional Administrator and dependent on Canadian program. Boundaries of both areas changed over time to reflect World Court decision on the Hague Line and changing resource conditions.

Closures became year-round vs. seasonal in 1994 via NMFS emergency action at the request of the New England Fishery Management Council. Key groundfish stocks were at historic low levels. The Council adopted changes in the Fishery Management Plan shortly thereafter.

##### ***SNE Closed Spawning Area***

Originally was seasonally closed to reduce fishing mortality on and enhance spawning opportunities for yellowtail flounder. Evolved into Nantucket Lightship Closed Area for the same purposes. Boundaries changed to reflect areas in which yellowtail flounder were concentrated

##### ***WGOM Area***

Implemented May 1, 1998 as part of Framework 25 --- to significantly reduce fishing effort on Gulf of Maine cod.

#### ***Seasonal/Rolling Closures:***

Initially implemented in 1996 through Amendment 7 --- to rebuild key groundfish stocks (cod, haddock, yellowtail flounder) with boundaries based on harbor porpoise closures. Replaced in 1998 by rolling closures in Framework 25 --- to significantly reduce fishing effort on Gulf of Maine cod.

##### ***Rolling Closures expanded in Frameworks 26, 27, 31 and 33***

To reduce or maintain fishing mortality rates for five critical stocks (Georges Bank cod, haddock and yellowtail flounder and southern New England yellowtail flounder, and particularly Gulf of Maine cod).

## Appendix B: Trawl Fishing Data Elements

### Currently Collected from New England State and Federal Fisheries Agencies

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Shaded areas – potential required data elements to be consistent with NMFS trawl survey ( ) and observer program (X).

Data Elements	Predetermined Data Points	NMFS	ME/NH*	MA	RI	ACCSP At-Sea Observer	ACCSP *Com. Biological	SeaMap Southeast Trawl
<b>Vessel</b>								
Vessel Identifier								
Vessel Name								
Individual Identifier (Captain/Owner)								
Observer ID #		X						
Sampler Identifier								
Agency/Partner Identifier								
Fishermen Reports								
<b>Trip Information</b>								
Reporting Form Series Number								
Form Type/Version #								
Trip Start (date) – MM, DD, YYYY								
Target Species or Species Group		X						
Trip Number								
Number of Sets								
Project ID#								
Light Code								
Ancillary Station								
Country								
Cruise, Stratum, Tow								
Cruise, Stratum, Tow, Station								
Cruise code								
Cruise Notes/Comments								
Cruise Pictures								
Cruise Problem Sheets								
Cruise Results								
Cruise Tracks/Number								
Designated Towing Speed								
Trip End Date								
Other Gear Deployed								



Type of Cruise Conducted								
Sailing Orders								
Station								
N <sup>th</sup> consecutive # of given cruise on vessel								
<b>Haul Info.</b>								
Trip Identifier								
Haul #								
Haul Observed		X						
Target Species		X						
# of coded species (for a given tow)								
Lat. Begin								
Long. Begin								
Lat End								
Long. End								
Time Set (hour and minutes)								
Time Retrieved (hour and minutes)								
Depth Fished								
Minimum Bottom Depth								
Maximum Bottom Depth								
Pingers		X						
Gear Number								
Start Depth								
End Depth								
Barometric Pressure								
Wind Speed								
Wind Direction								
Sea State (wave height)								
Swell Direction		X						
Air Temp								
Precipitation		Weather						
Strata Code								
Surface Temp								
Bottom Temp								
Surface Salinity								
Bottom Salinity								
Direction of Current during tow								
Bottom Indicators								
Cable Out (surface to door of trawl)		Wireout						

Statistical Area & Blocks								
Predicted Statistical Area								
Bottom Speed								
Cloud cover (weather)								
Course								
Haul (success of haul)								
Compass Heading of Tow								
Starting Loran								
Ending Loran								
Maximum Latitude								
Minimum Latitude								
Maximum Longitude								
Minimum Longitude								
Mid Tow Longitude								
Mid Tow Latitude								
Pitch of Prop								
Season of tow								
RPM while towing								
Station type								
Strata Tow Sheets/Group/Name								
Description of Station Group								
Cruise Study Area Description								
Trash Amount								
Trash (Bio., Shell, Substrate) - percentage								
Temperature Profile								
Comments								
<b>Biological Information</b>								
Trip Identifier								
Haul Number		X						
Species (common, scientific names, abbreviations & codes)								
Length		X						
Units of Measurement		X						
Length Type		X						
Gender								
Were Biological Samples Taken		X						
Specimen Number								
Weight								

Sample Date		X						
Card (# lines/species/collection								
Pictures/Unidentified Species								
Age								
Catch Number								
Maturity Stage								
Number of Detail (# sheets for species examined)								
Number of specimen at given age								
Number of specimens at given length								
Prey								
Comments								
<b>If Landing/Selling Catch</b>								
County Landed		X						
State Landed		X						
Port Landed		X						
<b>Subsample Log</b>								
Trip Identifier								
Haul #								
Subsample Amount or Weight								
Units of Measurement of Weight								
Species								
Disposition								
Grade								
Quantity								
Units of Measurement of Quantity								
Estimated or Actual								
Biological Sample Weight								
Expansion Factor (sample to total)								
Comments								
<b>Gear for Trawl Fisheries</b>								
Gear Code								
Gear Number								
Net Name								
Net Position								
Door Type								

Door Length								
Door Height								
Door Weight								
Net Construction Material		X						
Headrope Length		X						
Footrope/Sweep Length		X						
Ground Cable Length								
Top Bridle Length		X						
Bottom Bridle Length		X						
# of Meshes in the Fishing Circle		X						
Mesh Size in the Fishing Circle		X						
Mesh Type in the Fishing Circle								
Measurement Type in the Fishing Circle								
Codend Hung		X						
Codend Twine Type		X						
Codend Twine Material		X						
Codend Twine Diameter		X						
Codend Mesh Size		X						
Liner Used		X						
Liner Mesh Size		X						
Liner Mesh Type		X						
Codend Strengthened Used								
Codend Chaffing Gear Used		X						
Codend Length								
Codend Circumference								
Codend Mesh Size		X						
Codend Mesh Type		X						
Codend Measurement Type		X						
Graduated Mesh in Net Body								
Minimum Mesh Size in Net Body								
Maximum Mesh Size in Net Body								
Net Body Mesh Type								
Net Body Mesh Measurement Type								
Cable Type		X						
Cable Diameter		X						
Leg/Bridle Diameter		X						
Footrope Type		X						
Footrope Diameter		X						
Trawl Extension Mesh Size								

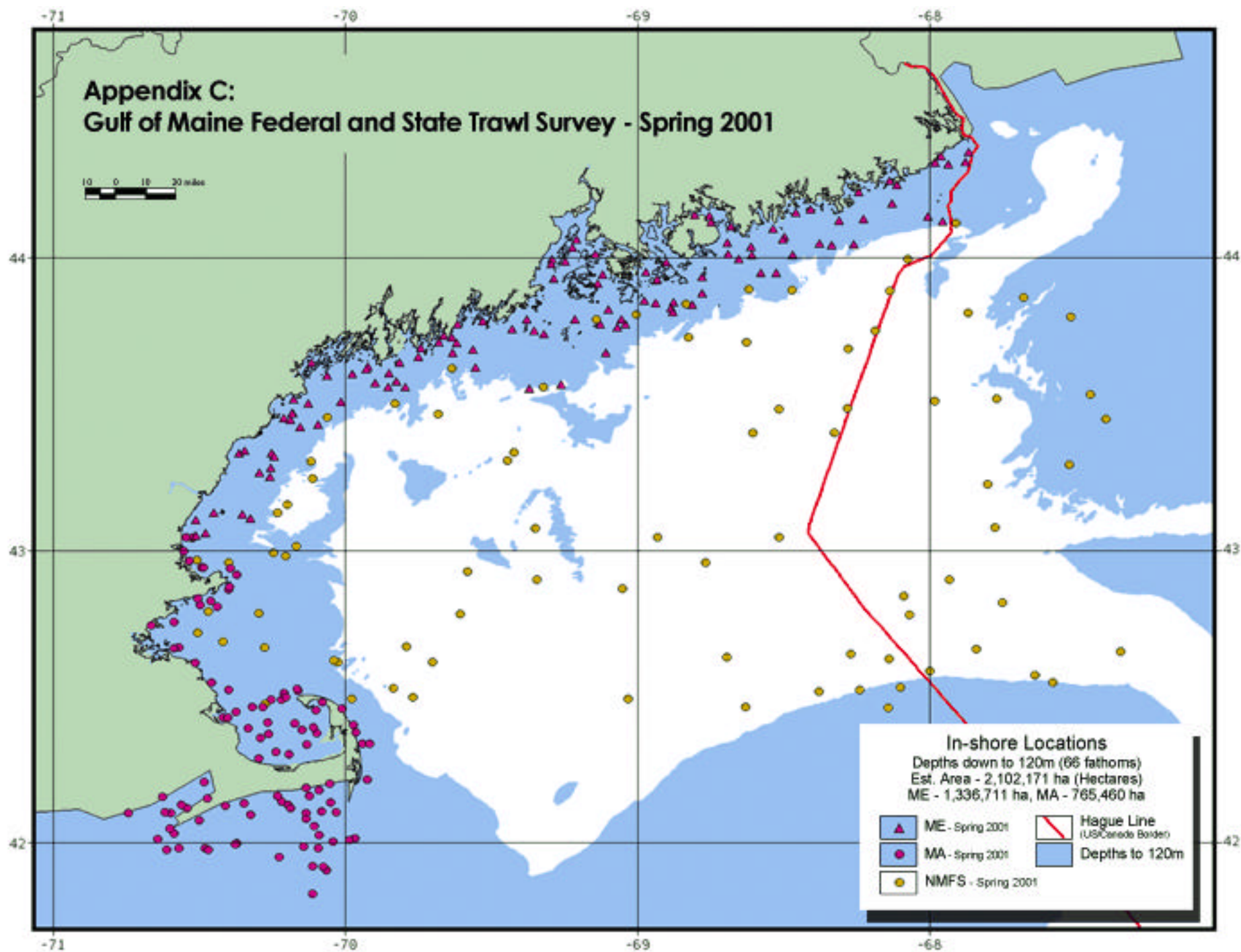
Trawl Extension Mesh Type								
Trawl Extension Mesh Measurement Type								
Tickler Chain Length		X						
Tickler Chain Size		X						
# Floats on Headrope								
Floatation Diameter								
Loop Chain Length								
Loop Chain Size								
# of Links Per Loop								
# Loops Per Net								
Type of Release/Discard Reduction Device								
Gear Condition/Comments								
<b>Data Management</b>								
Date of change								
Date of entry								
Status of data								
User of change								
Data enterer								

\*Incomplete assessment of data elements

# Appendix C: Gulf of Maine Federal and State Trawl Survey - Spring 2001

10 0 10 20 miles

34

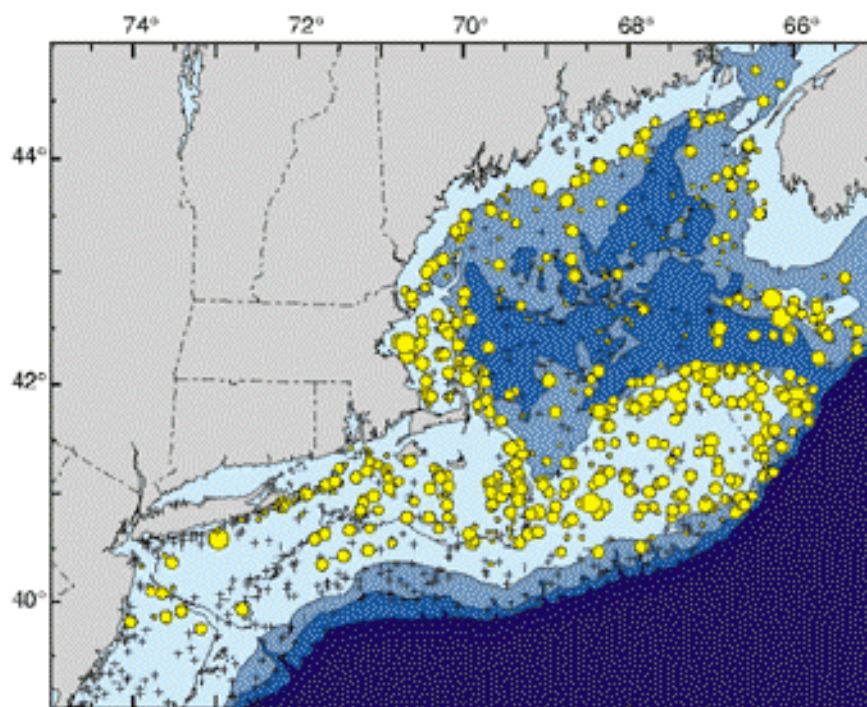


## Appendix D:

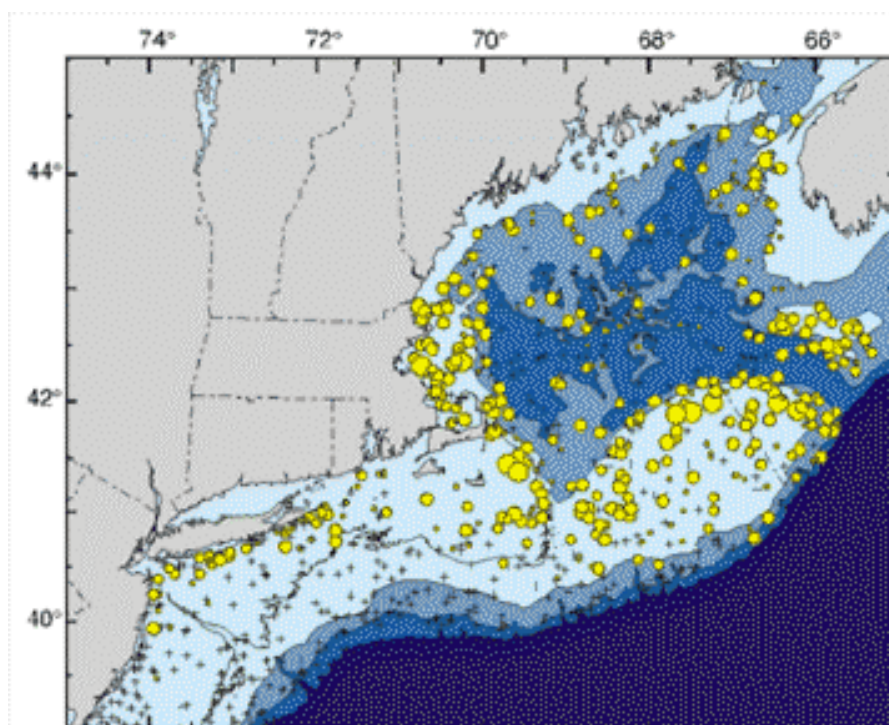
### NMFS Bottom Trawl Survey Atlantic Cod - Spring 1979 to 1999

Provided by the Northeast Fisheries Science Center.

Relative abundance of Atlantic cod (kg/tow) is represented by circle and sampling effort is indicated by a small x. Size of circle is proportional to catch.

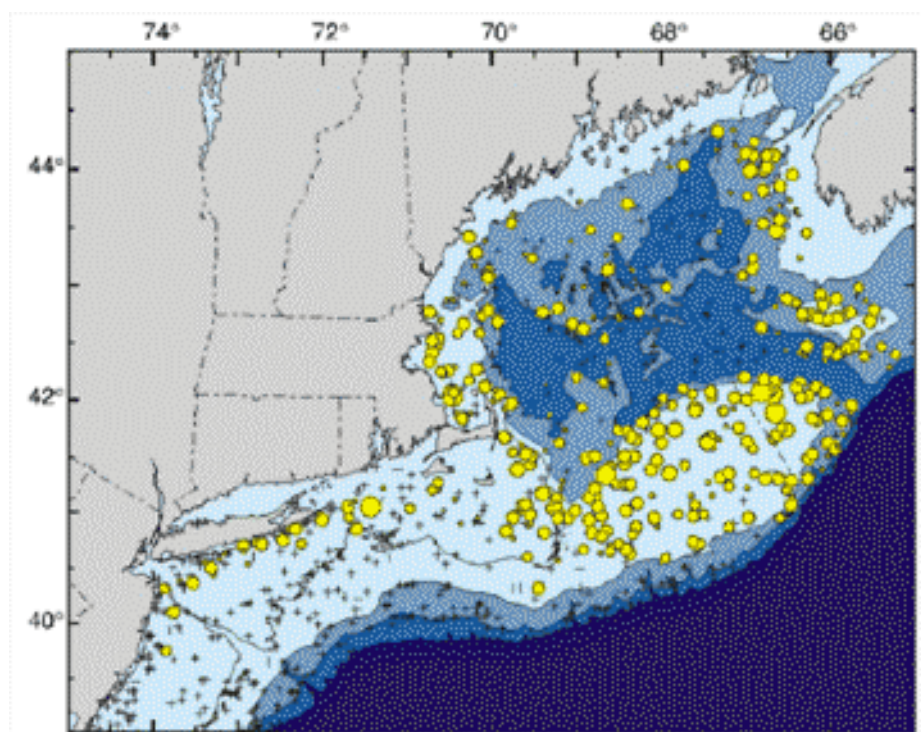


Spring 1979 - 1981

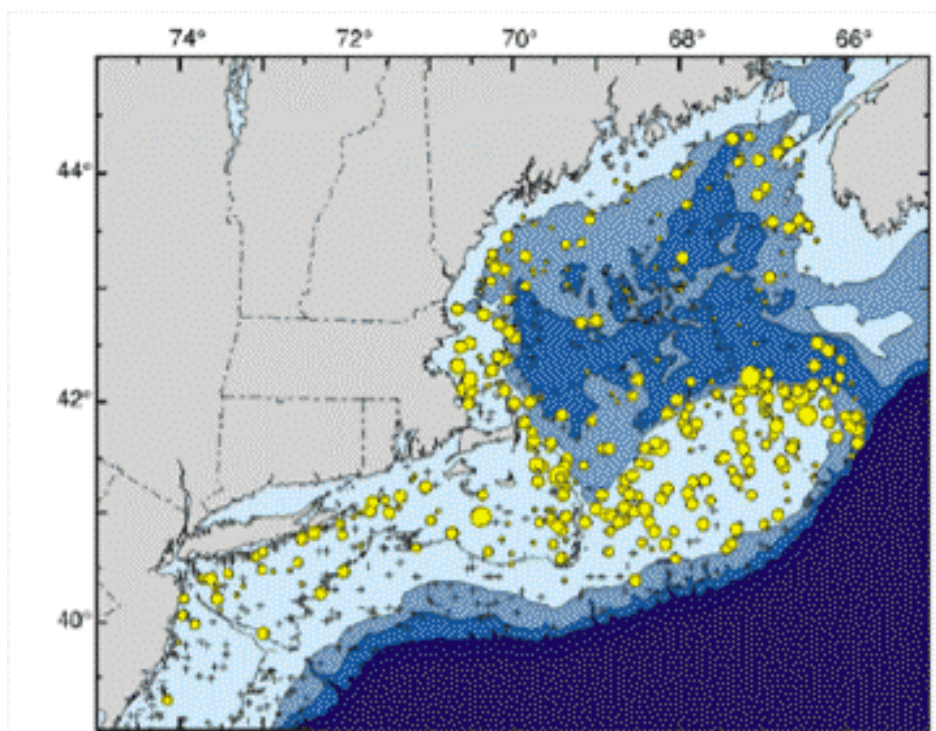


Spring 1982 - 1984



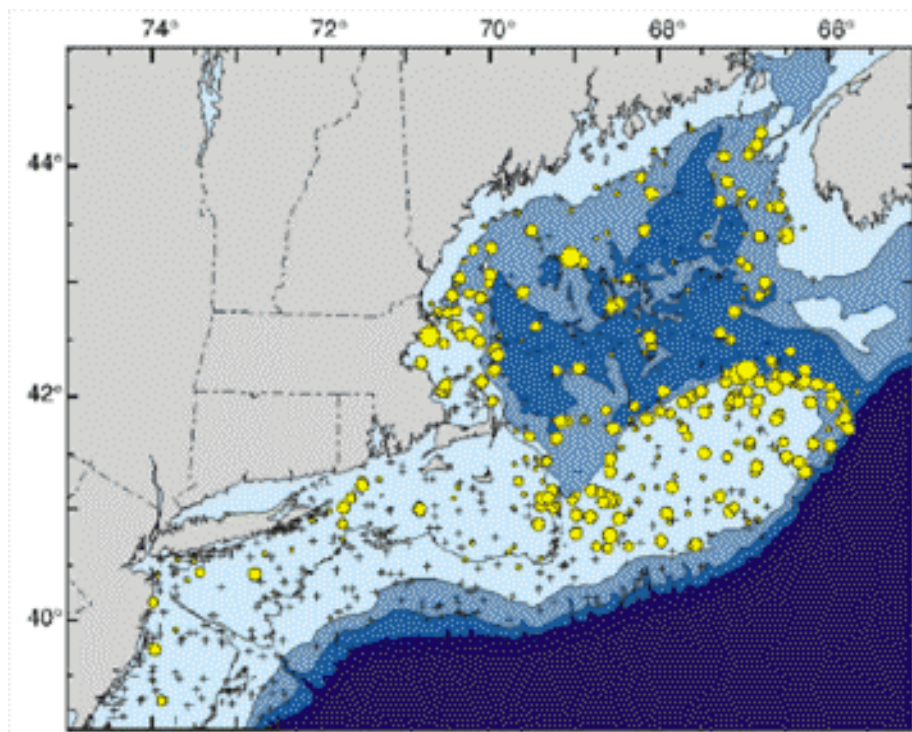


Spring 1985 – 1987

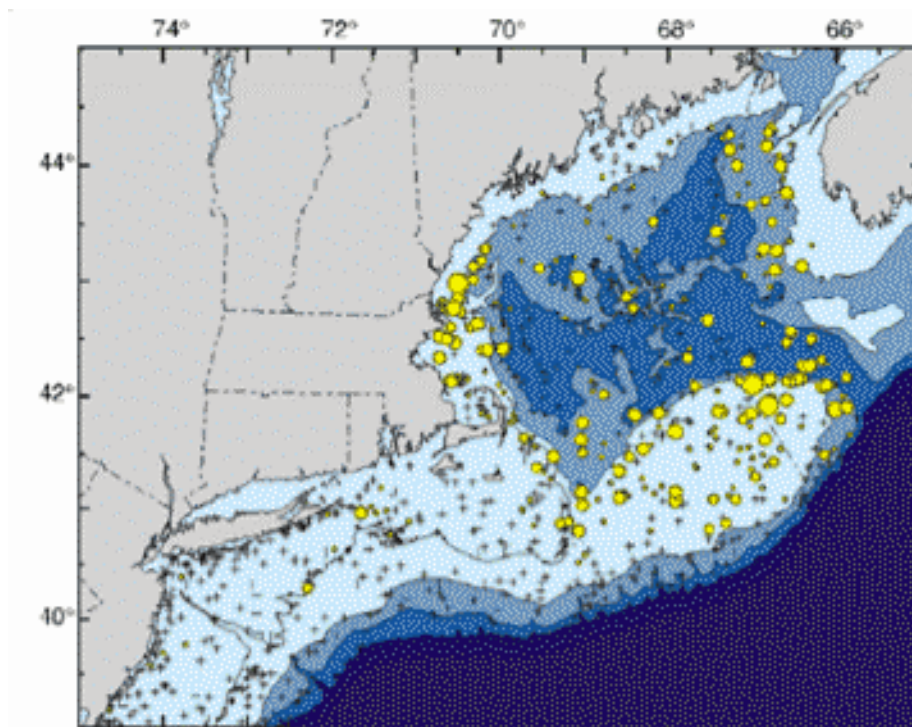


Spring 1988 – 1990

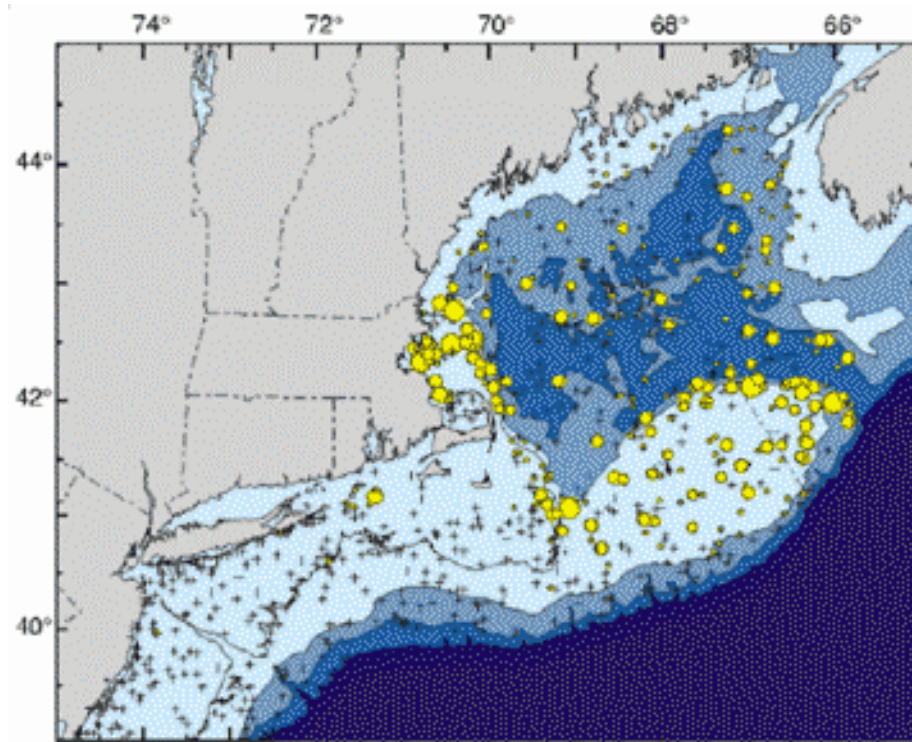




Spring 1991 – 1993



Spring 1994 – 1996



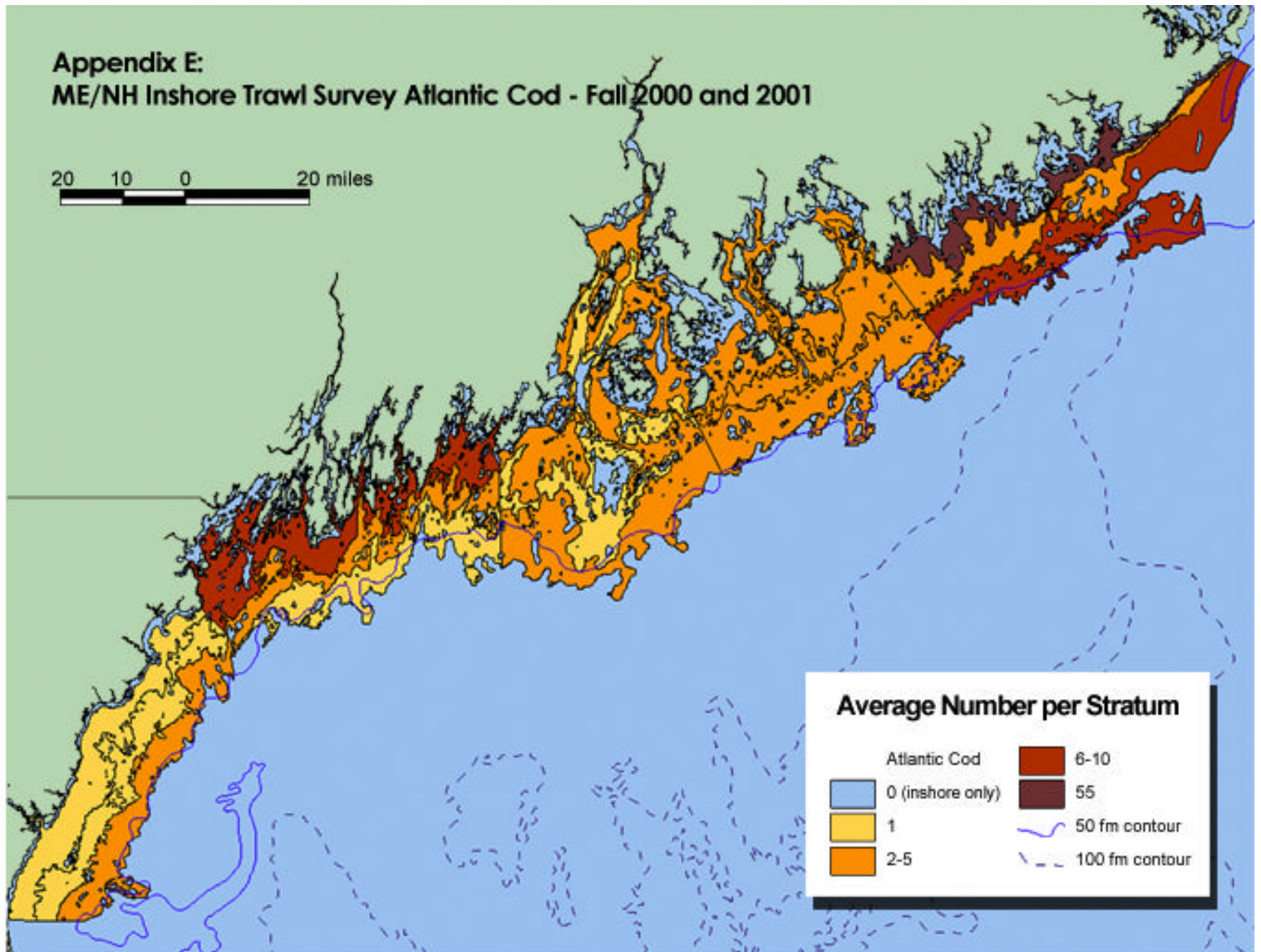
Spring 1997 - 1999

For more information, see:

<http://www.nefsc.nmfs.gov/nefsc/publications/text/nefscseries/current/techmemo/AtlanticCod124.pdf> (6.7MB, PDF)

**Appendix E:**  
**ME/NH Inshore Trawl Survey Atlantic Cod - Fall 2000 and 2001**

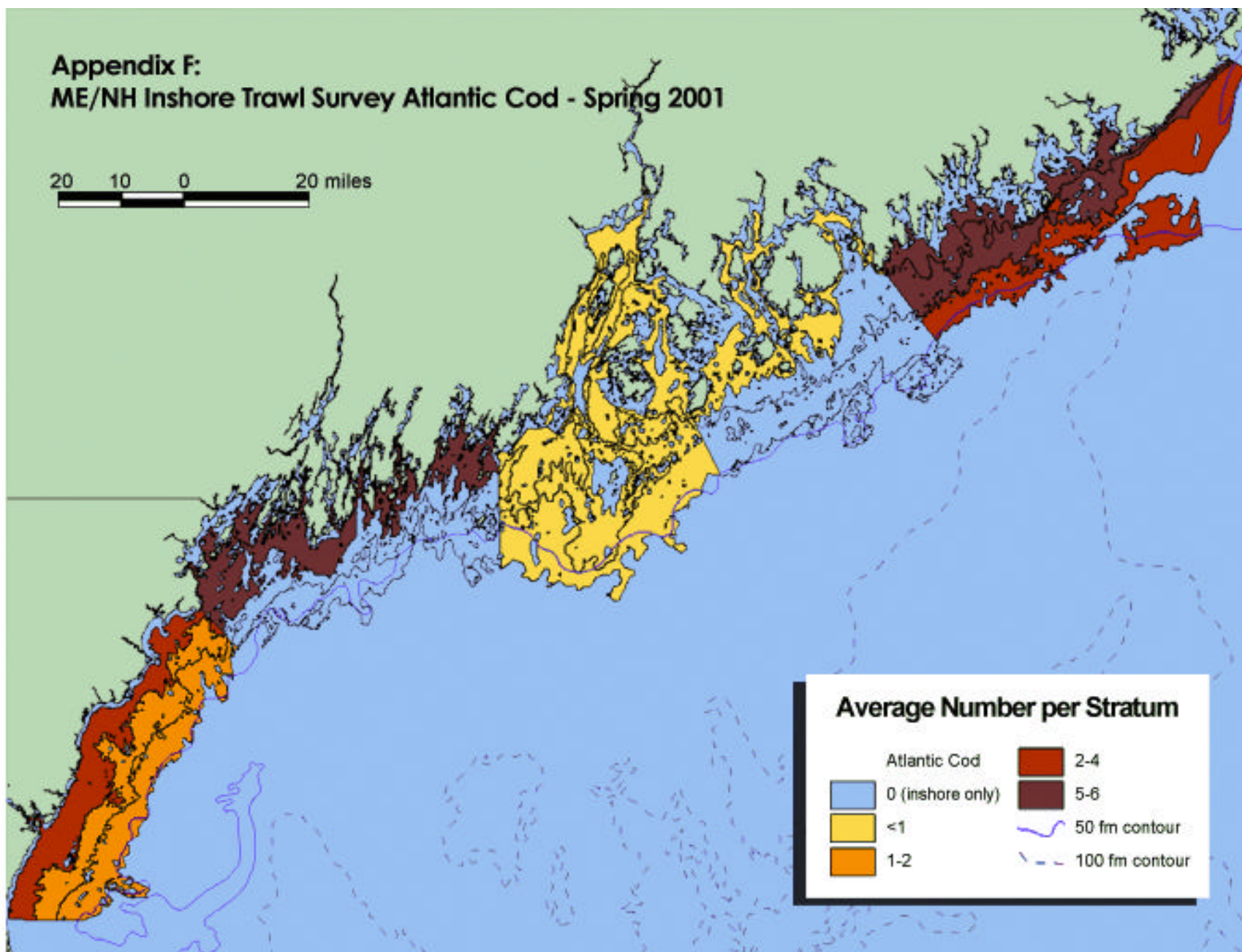
20 10 0 20 miles

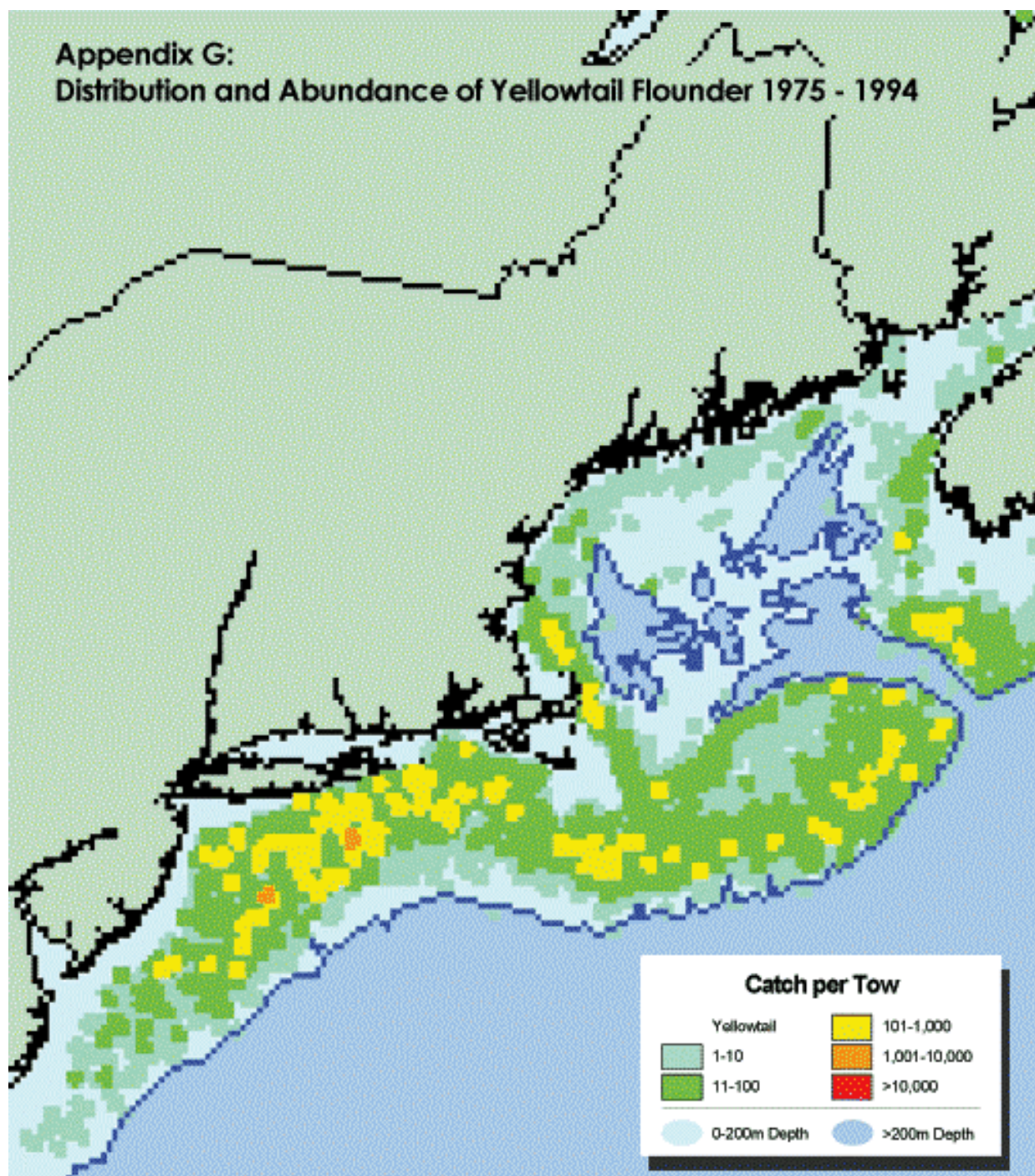





**Appendix F:  
ME/NH Inshore Trawl Survey Atlantic Cod - Spring 2001**

20 10 0 20 miles



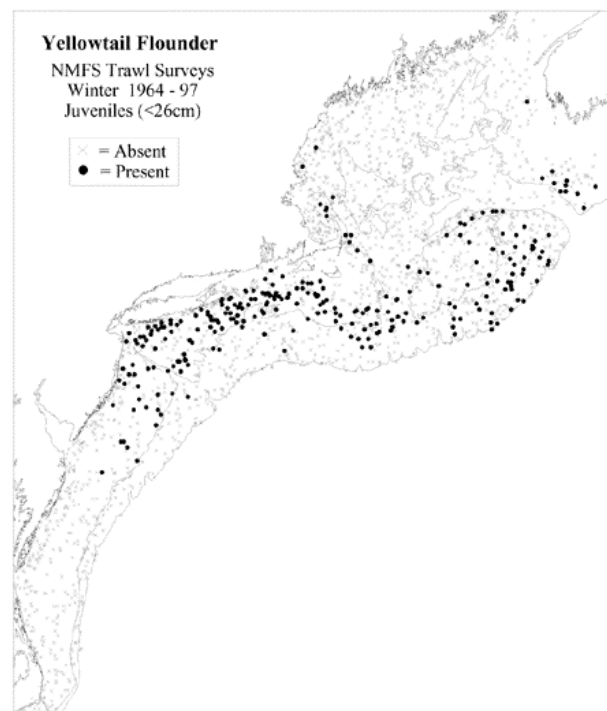
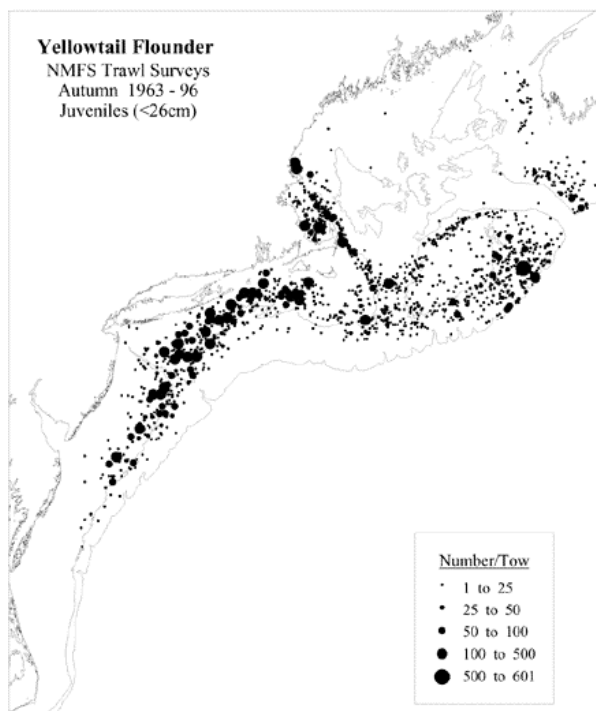
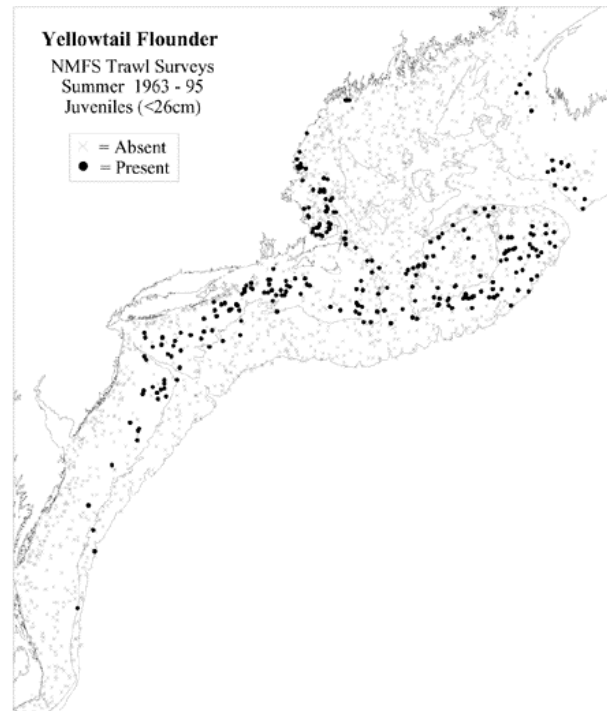
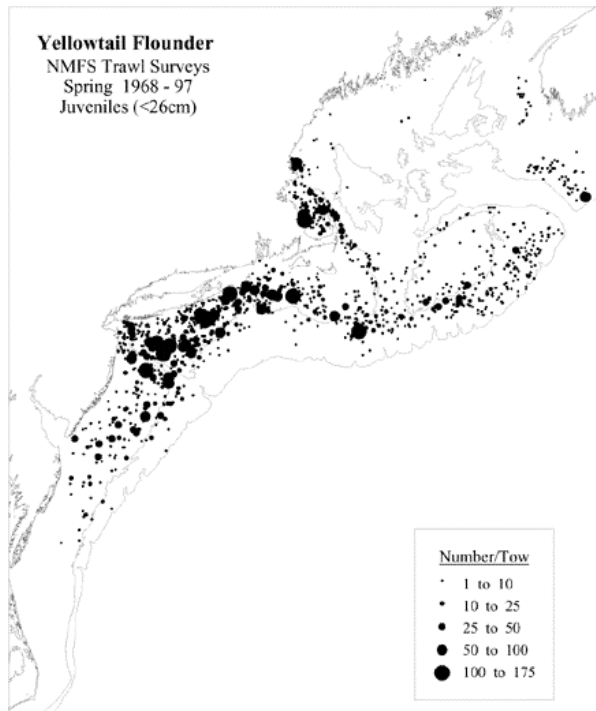
Distribution and abundance of Yellowtail flounder from Nova Scotia to Chesapeake Bay based on research trawl surveys from the U.S. NOAA/Canada DFO East Coast of North America Strategic Assessment Project. ). Original image projection: Lambert conformal conic. ([http://www-orca.nos.noaa.gov/projects/ecnasap/ecnasap\\_table1.html](http://www-orca.nos.noaa.gov/projects/ecnasap/ecnasap_table1.html))

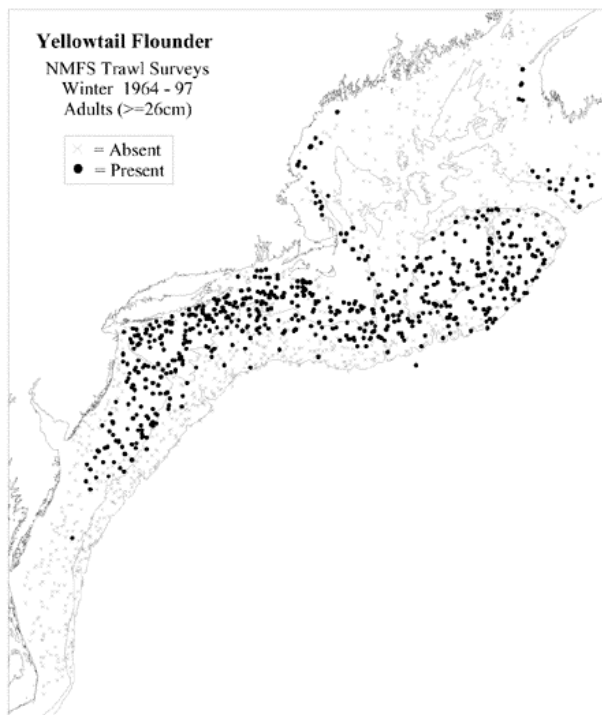
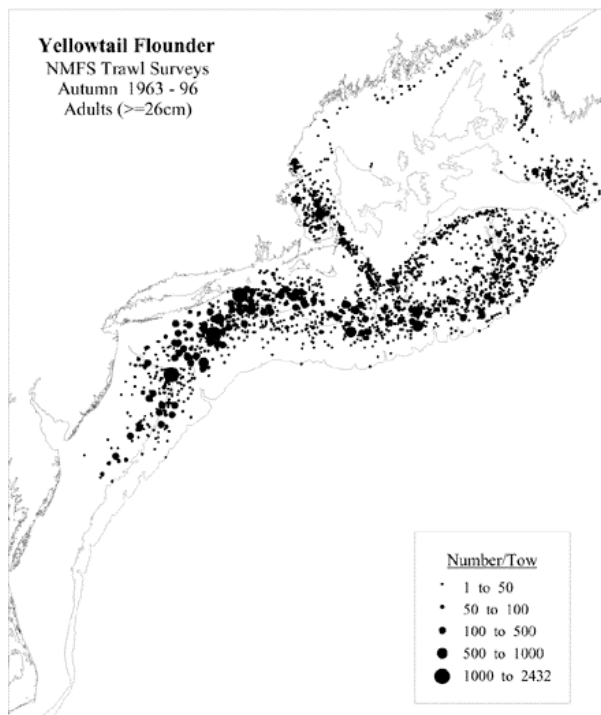
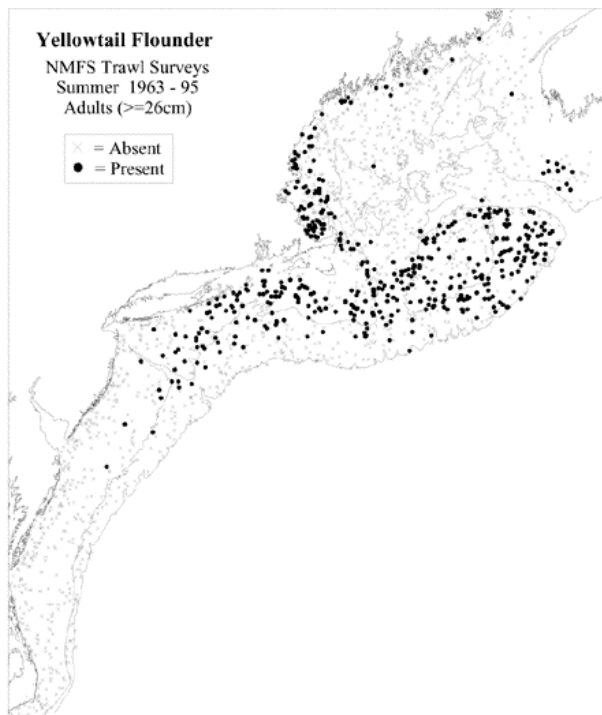
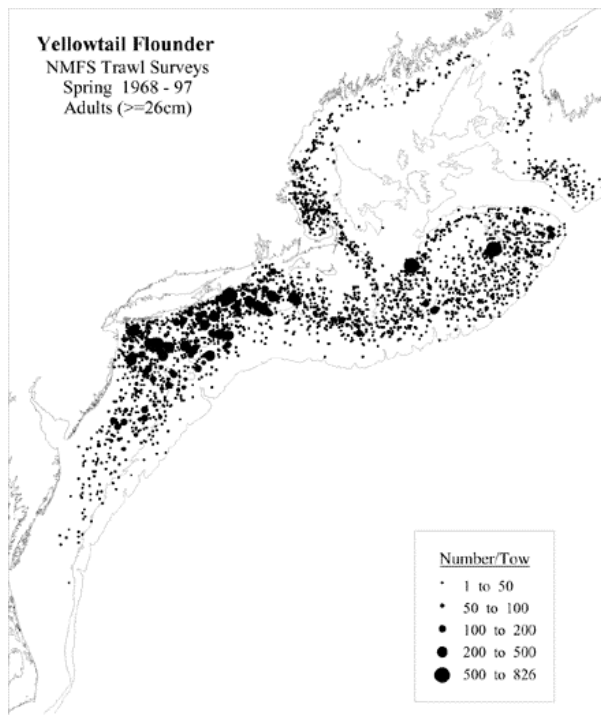
Click on map to enlarge.  
(<http://www-orca.nos.noaa.gov/projects/ecnasap/maps/ytlfld.gif>)



## Appendix H: NMFS/NEFSC Bottom Trawl Survey Yellowtail Flounder – 1963 to 1997

Distribution and abundance of juvenile and adult yellowtail flounder during NEFSC bottom trawl surveys during all seasons from 1963 through 1997. Densities are represented by dot size in spring and fall plots, while only presence and absence are represented in winter and summer plots.





For more information, see pages 30-31 of:  
<http://www.nefsc.nmfs.gov/nefsc/publications/text/nefscseries/current/techmemo/YellowtailFlounder140.pdf> (5.6MB, PDF)

# Appendix I:

## Industry-based Survey Committee Meeting Minutes

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### **Industry-based Survey Fleet Committee August 6 and 7, 2001 Urban Forestry Center, Portsmouth, NH**

#### ***Monday, August 6:***

Committee Members Attending: Marshall Alexander, Portland, Maine; Pat Fiorelli, New England Fishery Management Council; Wendy Gabriel, National Marine Fisheries Service, Science Center; Chris Glass, Manomet Center for Conservation Sciences; Linda Mercer, Department of Marine Resources Laboratory; Earl Meredith, National Marine Fisheries Service, Cooperative Research; Frank Mirachi, Scituate, Mass.; Cheri Patterson, NH Fish and Game Department; Kelo Pinkham, Trevett, Maine; Liz Rowell, Charlestown, Rhode Island; and Bob Tetrault, Portland, Maine. Staff: Don Perkins and Laura Taylor, Gulf of Maine Aquarium.

Don Perkins opened the meeting by giving a brief background of the discussions facilitated last year by the Gulf of Maine Aquarium (GMA) and National Marine Fisheries Service (NMFS) on industry-based surveys and study fleets. The Industry-based Survey Fleet Committee (IBS Committee) is tasked with taking last year's discussion to the next step and recommending an IBS program for the Gulf of Maine. How do you implement an industry-based survey in New England? How do you use industry-based surveys to compliment the NMFS survey?

#### **IBS Project Overview:**

Earl Meredith, Acting Director of NMFS Cooperative Research Programs, gave an overview of the issues that resulted from the industry meetings.

#### *Issues from the Scoping Meetings:*

- 1) Science-management mistrust
- 1) Public appreciation of industry commitment to conservation
- 1) NMFS long term commitment to cooperative research
- 1) Timely data production

Meredith described the study fleet as a sample of the entire fishing fleet in a normal fishing mode, while the survey fleet is a fishery independent, scientifically designed survey. The goals of the survey fleet are:

#### *Goals of Industry-based Survey Fleet:*

- 1) Increase spatial/temporal data for assessment
  - a. Shallow/coastal
  - a. Sampling design
  - a. Multi-gear



- 1) Calibrate IBS/NMFS
  - a. Understand long term
  - a. Calibrate???
- 3) Use fishing vessels to monitor closed areas before, during and after closure.

Congress allocated \$15 million to NMFS as groundfish disaster relief funds to be used for cooperative research efforts. NMFS plans to spread the funding out over 3 years and focus on establishing an industry-based study fleet, an industry-based survey fleet, a cod tagging program and gear modification research. Roughly \$6-7 million has been allocated for both the industry-based study fleet and industry-based survey fleet over the next three years. The IBS Committee has been established by NMFS to accomplish the following:

*Purpose of IBS Committee:*

- 1) Develop a Plan to implement an industry-based survey
  - a. Identify resources needed
  - a. Define participation criteria
  - a. Determine infrastructure needs
- 1) Produce Report for NMFS
  - a. Criteria
  - a. Timeline
  - a. Budget
- 1) Fall pilot program
  - a. Recruit F/V
  - a. Design
  - a. Integrate with states
  - a. Infrastructure

The Committee discussed their concerns about the industry-based survey:

*Committee Concerns:*

- 1) Long-term funding needs
  - a. Must develop pro-active plan
  - a. Traditional avenue (Dept. of Commerce)
  - a. Non-traditional (Dept. of Agriculture)
  - a. DOC revenue established \$ 1 billion
- 1) \$6-7 million over 2-3 years
  - a. establish 2 scenarios – “realistic” and “wish-list”
- 3) Develop a major outreach strategy to avoid conflicts
- 3) Avoid dueling assessments (focus on enhancing calibration) (history of incorporating state surveys) (distribution is key issue)

Earl Meredith gave an overview of the *Study-fleet committee's progress*. The Committee met on August 2 and is working to define a list of minimum daily data requirements that would be needed for an effective study fleet. The Committee is also exploring electronic reporting mechanisms to replace logbooks and speed up turn-around time. Finally, the Committee will be

meeting with law enforcement about how data may be used (or not used) for enforcement and with technology experts and data experts to learn how to get data in a real-time basis but in a resolution that does not reveal proprietary information.

### **Committee Goals for IBS Project:**

The IBS Committee was asked to discuss their individual goals for an industry-based survey. The Committee quickly concentrated on closed area monitoring as a major issue on which to focus an industry-based survey, including the following elements:

#### *Closed area monitoring:*

- 1) Pre – during- post closure
- 1) Jeffreys; Western GOM closure
- 1) Rolling closures – 124/125
- 1) Refining closed area via fine scale information
  - a. Temporal and spatial information;
  - a. Define criteria for closures and assessment before closure;
  - a. Identify types and uses of habitat (spawning/juveniles/adult aggregation)
- 1) Identify functionally closed areas (due to bottom type, lobster traps)
- 1) Map closures
- 1) Before acting to close and area – need seasonal distribution
- 1) Document inshore/offshore/coastwide fish presence/absence/migration to have basis for alternative closures
- 1) Coordinate IBS with Study Fleet (closed area vs. open (fished) areas)
- 1) Maine – look at inshore closures with IBS – monthly snapshot
- 1) Identify what is working as intended or not intended; what works and why around closures (e.g. square mesh on GOM flounder)

The other goal the IBS Committee discussed was providing additional data to the NMFS trawl survey. In essence, the IBS funds could be used to provide resources for special targeted research. The Committee discussed the following:

#### *Complimenting NMFS Survey:*

- 1) Targeted/ fine scale data over time and space
- 1) Transect surveys along the coast at mouths of rivers – reactivate; pick up migratory species presence/absence; river pollution – impact on spawning?
- 1) Side-by-side gear comparisons
- 1) Other sources of pressure on specific species/stocks besides harvesting – pollution; predators (e.g., monkfish increases, whiting increasing)
- 1) Fixed gear survey for hard bottom – inner GOM and western GOM; identify with NMFS survey group and fishing industry
- 1) Use of other gear – fixed gear – gillnets – traps – hooks – acoustic – video – other oceanographic data (look at Sentinel model)
- 1) Deep water research -
  - a. Monkfish, white hake, witch flounder

- a. Deepwater, fixed gear, steep contours
  - a. Look to other disciplines to explain changes (e.g. fish going deep)
- 1) Fill in data holes – Downeast Maine
- 1) Synoptic survey – multiple F/V's survey at one time (like x-mas bird count)
- 1) Rhode Island – expand yellowtail study; scup survey; fluke (caught between mid-Atlantic and NE councils)
- 1) Massachusetts level of survey vs. NMFS surveys
  - a. Bays 1/10
  - a. Strips 1/10
  - a. NMFS 1/100

### *Calibration of Data:*

There was concern among the IBS Committee about the need to calibrate any additional data with current NMFS data. In particular, the Committee wanted to avoid dueling assessments between NMFS and the industry-based survey. The focus should be on the quality of the research. NMFS has a history of using other sources of information in assessments to compliment their information. The IBS project is a great opportunity to provide supplemental information and should not fall in trap of replicating what we already have. The issue is not as much dueling assessments, but different objectives of each survey. The NMFS trawl survey has a broad, coast-wide picture.

The issue of calibration can be significant, but surveys can be integrated if you can generate a robust time-series that you don't have to calibrate to each other (e.g. NMFS and MA as independent time-series). Each series is robust in and of itself with a standardized piece of gear on the same vessel and will standardize itself over time. Calibration will also be necessary as the boats involved in the survey change. The Committee discussed the following components of calibration issues:

- 1) Basic calibration – strategies or species? (e.g. beam gear, fixed gear?)
  - a. standard gear? – wires, doors, net
  - a. standard speed
- 1) Integrate with ACCSP
- 1) Define Data Requirements

### **Vessel Compensation:**

The IBS Committee also discussed vessel compensation issues. The focus of compensation should be on the results, not effort. The current method for compensation of vessels varies among projects and this should be standardized. The industry members of the committee view vessel participation as “fishing for data instead of fishing for fish”. With this in mind, a vessel should not be compensated for bad weather days just as no fish are caught and sold on bad weather days. Following is a summary of the issues that we raised regarding vessel compensation including observer training, sale of catch and data collection.

*Issues Regarding Vessel Compensation:*

- 1) Focus on results – not effort – results-based compensation
- 1) Compensate by # tows completed vs. contracted?
- 1) Bad weather is same as for fishing day – no pay
- 1) Observers – standard expectations; F/V checklist; safety training
- 1) Differential view of science/industry/observer workday
- 1) Sale of discard of catch?
  - a. Standard policy
  - a. Discard vs. sale \$ to project vs. sale \$ to vessel
    - i. Politics with other fisheries
    - i. \$\$ cash
    - i. promote methods to enhance survival
- 1) Need to specify gear/tow performance for uniformity and compensation
- 1) Vessel selection requirements
  - a. Capabilities
  - a. Payment by performance
  - a. Ability to process fish (short tows) – quality control as fish # increase
  - a. Scope of work
  - a. Training – measuring, weighing, - crew and observers
  - a. Crew handle fish and scientists process data??
- 1) Technology strategy for on-deck data acquisition
- 1) Maximize industry responsibility (even to data collection ...?)
  - a. Number of vessels a key issue:
    - i. small # -- trainable
    - i. large # -- lower expectations
    - i. need adequate personnel
    - i. industry clearly handles fish
    - i. who measures? – shoreside processing?

**Strength vs. Weaknesses and Opportunities vs. Constraints of an Industry-based Survey:**

The Committee briefly expressed their thoughts about the potential of the industry-based survey project.

*Strengths :*

- Palatable
- More data
- More cost-effective
- Communication
- Time/area coverage
- Science/industry interaction
- Tap industry knowledge
- Better management

*Weaknesses:*

- Quality control
- Industry commitment
- Science commitment
- Academic/science skepticism
- Agenda driven
- Industry skepticism
- Failure due to lack of long term commitment
- Communication
- Lack of money – decreasing aortic?
- Economic competition with Days at Sea

*Opportunities:*

- Increase trust
- Increase quality data
- Increase management effectiveness
- Diversity industry revenue
- PR – credit for industry; public science
- Public understanding of industry
  - Proactive management
  - Cooperative science – cooperative management
  - Flexibility to broaden science scope

*Threats:*

- Jones Act – litigation from non-crew
- Experimental fisheries permit
- Funding instability
- Pseudo-government intervention
- Lack of quick success
- Agenda driven science
- Dueling assessments
- Suspicion of other fisheries
- Fraudulent data

**Short-Term Project Strategies:**

The Committee was asked to focus on short-term strategies for implementing an industry-based survey within the next few years. There was a concern about how to prioritize projects with shifting management concerns (e.g., Amendment 7, Amendment 13, cod problem decreasing and yellowtail increasing, etc.) The suggestion was made to have the industry-based survey fleet focus on the best science instead of trying to attack the biggest brush fire. The Committee discussed the following projects:

- 1) Rhode Island – Predator/prey Increases
  - a. No SNE yellowtail flounder survey since 1996
- 1) Prototype Closed Area Project -
  - a. Hole in science to date;

- a. Lends to surveys year-round;
  - a. Articulate if hole actually exist (vs. trawl survey);
  - a. Start with a very restrictive survey that can be expanded in the future to other inshore/offshore areas.
- 1) Document Closed Areas – future, current and functional closures -
  - a. *Western GOM* (including Jeffreys)
    - i. Set to sunset with one year extension
    - i. Criteria for opening or keeping closed
    - i. GOM haddock stock – where, abundance, GB exchange, structure
  - a. *Nantucket Shoals Lightship*
    - i. Sole, yellowtail
    - i. Permanent closure
    - i. Configuration? – original reasons; current impact
  - a. *Rolling Closures* –
    - i. Spawning area protection, 1/2 minute blocks
    - i. Original purpose (decrease cod fishing effort) – identify spawning areas; control effort to decrease mortality (look at distribution)
    - i. What is the current impact now that it is closed?
    - i. Does closure size/schedule work? (distribution of fish vs. closure)
    - i. Closures usually stop all sampling – need more small-scale sampling after closure
    - i. Sampling all closures involves participants coast-wide as well as fish distribution/abundance information
    - i. Assess potential species specific closures fishable for other species
    - i. Is spawning area protection achieved?
      - As cod biomass increases and reopen, catch spikes, increase discards (daily limit)
      - Areas where vulnerable fish are not?
      - Habitat needs for other life stages??
- 1) Compliment NMFS Trawl Survey:
  - a. Migration (transects)
    - i. More data over time and space;
    - i. More data over geography;
    - i. Species specific (e.g., monkfish, shrimp, etc.);
    - i. Habitat specific
- 1) GOM cod distribution/structure/migration
- 1) Whiting distribution/structure
  - a. GOM
  - a. Southern New England
- 1) Comprehensive (synoptic) Transects:
  - a. habitat;
  - a. gets current species;
  - a. basis for future;
  - a. validate where fish are not.
- 1) Massachusetts – fluke; black seabass; scup
  - a. State surveys summer and fall
  - a. These are summer fisheries

- 1) Scup - acoustic survey?
  - a. Discards
  - a. Hard to predict
  - a. Is this groundfish applicable (i.e., need to make link from research needs to funding requirements (groundfish funds))
- 1) Redfish/Monkfish/White hake/ Witch flounder
- 1) Transects – across fathom curves; good for mapping

*Data Required:*

- Closed areas
- Space/time
- Species-specific
- Habitat

*Data Management:*

- Section, collection, analysis and storage
- What to collect;
- How is data going to be used? – processed, analyzed, stored-archived, distributed
- Long-term protocol and management
- ACCSP data structure
  - relevant?
  - minimum data focus
- Look at NMFS/MA/ME-RI data

*Budget into Every Survey:*

- 1) Data selection
- 1) F/V collection
- 1) Processing (who is going to take data in raw form and input)
- 1) Analysis – basis description analysis
  - a. Whose job? Working group like SAR process?
  - a. How will feedback be done to industry?
- 1) Distribution – change in methods; metadata
- 1) Archive/Storage (NMFS has concerns about needing to house data because NMFS has ultimate responsibility for public information and management.)
- 1) Cost Factors – collection, collation, etc. – data processing is a key component of whole process.

**Long-term Goals of Industry-based Survey:**

- 1) New NMFS Research Vessel – gear technology workshops to be held this fall; interested in industry input, particularly in wheelhouse gear
- 1) Manage “whole picture” vs. Side Effects – getting information to evolving management:
  - a. multi-species vs. single
  - a. habitat
  - a. predator/prey
  - a. ecosystem
- 1) Access and Use of Information from Fishing Industry

- 1) Increase Information on Movement, Distribution, etc.
- 1) Develop a Pro-active Research Program - Pool of special purpose research capacity:
  - a. current focus –reactive
  - a. future focus – emerging needs
- 1) Community-based Management
  - a. Research and information
  - a. evolving management and organization
- 1) Filling Holes in Science
- 1) Cost Effectiveness
  - a. Available fishing vessels vs. research vessel infrastructure long term
- 1) Promoting Cooperation and Reducing Conflict
  - a. Early intervention conflict resolution
  - a. Arguments more fact-based, less opinion-based
- 1) Outreach
  - a. How do extend cooperation beyond core group?
  - a. Success speaks for itself
  - a. Build on science/industry success (e.g., Rago, Schick, DMF, etc.)
  - a. Public Relations Strategy – coordinate with Study Fleet
    - i. Need success stories
    - i. Need to publicize



## ***Tuesday, August 7:***

The IBS Committee re-convened on Tuesday to discuss further the details of an industry-based survey fleet. The morning session started with a discussion of the concerns and issues the Committee had after the previous day's session.

### **Concerns/Issues Raised by Committee Members:**

- 1) Tapping Academia – need to include their input in the process
  - a. Involve on local teams
  - a. Involve on oversight committee
  - a. Graduate students
  - a. Training fishermen
  - a. Start small – achieve success
- 1) Manage Unrealistic Expectations
  - a. F/V catch > R/V catch
  - a. Raw data processing and Interpretation
  - a. Canadian Sentinel Survey as model
  - a. How to harmonize F/V – R/V (area swept correction)
  - a. Time series needs
- 1) PR Strategy
  - a. Cooperative research conference
  - a. Industry audience (media)
  - a. General public (media)
  - a. Fishing communities
  - a. ID interested reporters
- 1) Fishermen Training
  - a. Interpretation of F/V vs. R/V data
  - a. Might be a part of initial step of IBS projects

The Committee spent the remainder of the day focusing on the criteria with which to evaluate projects under the two areas identified as broad industry-based survey topics: 1) complementing the NMFS trawl survey and 2) investigating closed areas.

### **Discussion of Potential Trawl Survey Projects:**

- 1) Long Term vs. short term
- 1) More intensive coverage/ current survey mode?
- 1) Location - near to mid-shore
  - a. Effects a number of small vessels
  - a. Addresses gap between state-NMFS survey
  - a. Nearshore Essential habitat – spawning – juvenile
  - a. Pollution effects
- 1) Distribution
  - a. Summer/winter vs. spring (April)/fall (October) – or some more sampling around spring/fall (Feb-June/ Sept-Nov)
- 1) Abundance information

- 1) Looking for a mixture of projects - Ongoing data gathering vs. one-off mix
- 1) Defining species of interest
  - a. avoid reactive management crisis disaster mode
  - a. species regard to groundfishery – directly or indirectly
  - a. avoid parochial interests

*Information Needed for Any Coming Fishery Crisis:*

Distribution -

- spatial
- temporal

Life History -

- spawning
- juvenile

Stock Dynamics -

- age structure (assessment)

Habitat -

- type of seabed
- temperature
- O<sub>2</sub>
- Salinity

\*\* Speed of processing information a key issue of concern.

NMFS has 50 to 70 stations in the entire Gulf of Maine. The Committee suggested increasing the number of stations in space and over time to get more detailed information on near shore and mid-shore data. A subcommittee will need to examine the NMFS data and the Maine and Massachusetts trawl survey data to see how far offshore it goes. The suggestion was for 20 +/- miles or 80 +/- fathoms. The survey needs to fit and complement current data – survey currently untowable bottom, low-cost transects, and increase temporal coverage.

The Committee also discussed the pros and cons of a short-term project vs. a longer term project. On the short-term side, tangible project results would benefit the industry and indicate that progress is underway. However, the scientific robustness of the data will only be realized over a long-term data gathering effort.

**Discussion of Closed Area Projects:**

*Types of Area Closures:*

- 1) Current closures – seasonal – permanent – sunset closures
- 1) Future closures
- 1) Functional closures – lobster areas, untowable bottom, etc.

*Criteria to Evaluate Closed Area Projects:*

- 1) Number of vessels impacted by closure
- 1) Multiple attributes
  - a. inshore/offshore

- b. depths
- c. habitat diversity
- d. seasonal vs. year-round
- 2) Management implications – ME inshore lower priority as inaccessible due to gear
  - a. Objectives of closures have changed over time Amendment 7 vs. 13
  - b. Other research projects underway
    - i. Undersea research project – Western GOM
    - ii. HACP area closed area #2
  - c. Trawl survey data gaps

*Need Measurable Attributes of Closed Areas that are Measured Over Time:*

- 1) Baseline:
  - a. Define objectives
  - b. Habitat relevant to objectives
    - i. Bottom – sediment – structure bottom and flora
    - ii. Water column – natural – anthropogenic
  - c. Oceanographic – currents – temperature
  - d. Predator/prey
  - e. Species x life history x time
  - f. Competitors
  - g. Sedentary vs. migratory behavior
  - h. Fine scale definition of fishing activity (study fleet?)
- 2) Monitoring:
  - a. Baseline parameters (above)
  - b. Species diversity/behavior
  - c. Change in species composition
    - i. Abundance
    - ii. Habitat
    - iii. Age structure
  - d. Compare to outside area – what serves as control?

The IBS Committee identified the following potential projects relating to closed areas:

- 1) Western GOM – more stationary/protected area
  - a. Habitat? Other habitat studies?
- 2) Rolling Closures –
  - a. Case study
    - i. Reduce cod management
    - ii. Protect spawning
  - b. Management implications
    - i. Opening
    - ii. Trip limit effects
    - iii. Functionally closed?
- 3) Area 1 and 2
- 4) Nantucket Lightship
  - a. Groundfish

- b. PDT – in discussions to shrink or move area
  - c. Baseline information would be beneficial
- 5) Comparative study between Western GOM and Rolling Closures?

The majority of Committee members favored a study of the Western GOM closure with perhaps a comparison with the rolling closures. It was acknowledged that data processing is expensive and the Committee should complement areas being proposed by the Study Fleet and NMFS trawl survey to increase density, increase habitat information and increase the number of transects in the Gulf of Maine. The closed area project could dovetail nicely with the distribution and seasonality work being proposed by the complimentary survey component of the IBS project.

### **Issues Surrounding Management of IBS:**

There are several management issues to address if an industry-based survey is going to be implemented in New England. The Committee spent a few moments discussing the various components of managing the industry-based survey fleet.

#### *Oversight -*

- Look over horizon
- Evaluate projects – prototypes, ongoing
- Coordinate with projects
- Financial management
- Science/industry vs. politics
- Collaboration/communications
- Outreach

#### *Project Management -*

- Plan/initiate/execute/report
- Vessel selection/logistics
- Equipment/gear
- Staff/observer function/training
- Project finances
- Bridge grassroots – oversight

#### *Data? Reporting?*

### **Follow-up Tasks for Committee Members:**

Finally, the Committee agreed to several follow-up tasks which included organizing sub-committees to focus on specific questions and issues raised during the session as described below.

#### **1. Data Items:** Cheri, Linda, Pat, Liz, NEFMC, MA, RI, and Earl on NMFS tech (Palmer/Woodzick)

( Note: 8/22 and 8/23 meeting in Woodshole includes Sally Sherman from Maine's trawl survey)

- Determine minimum data requirements for survey based on current trawl surveys.

- Explore existing data technology (seek information from Study Fleet committee)

**2. Vessel Items:** *Bob, Liz, Frank, NEFSC training*

- Design vessel compensation, selection and training requirements
- Recommend survey gear standards
- Define local knowledge job description (shoreside, sea, training)

**3. Canadian Sentinel Survey:** *Laura*

- Gather information and invite to October meeting

**4. Communication/Cooperation/Administration:** *Earl and Pat*

- Communicate IBS work/discussions with decision-makers – NEFMC, Research Committee, Regional Administrator, Public
- Update IBS Committee on timeline for reporting and beginning pilot project(s)
- Brief key stakeholders – NEFMC, Research Committee, Regional Administrator, Industry/ports, Committee absentees
- Coordinate GIS needs for IBS committee and potential expertise to advise on observers
  - GIS Staff:
    - Arnold Howe – DMF trawl survey person
    - Seth Barker – DMR
    - Curt – NERO
- Explore and define for contracting options
- Develop a public relations strategy
  - Provide reporter list - *Pat*
- Identify key advisors in experimental fisheries permitting process
- Define original goals and objectives for closed areas and brief IBS committee on the Regional Council's closed area discussions (on-going): *Pat*

**5. Develop Industry-based Survey Prototype:** *Linda, Wendy, Mike Foggerty, Cheri, MA, RI*

- Complimentary survey to NMFS – space, time, method
- Determine if survey data should increase NMFS/State trawls survey density or add areas using fixed gear (for example)
- Review Stock Assessment Review priority research areas
- Design way to integrate IBS data with Assessments

**6. Design Closed Area Prototype:** State representatives, Marshall (need industry person from the west)

- Determine NMFS trawl survey data gaps in closures (more than 2x year)
- Examine GLOBEC plankton survey for output of closures

**7. Chart IBS Committee Decisions:** how we're going to get from here to there – *GMA*

The next meeting of the IBS Committee is scheduled for October 2 and 3 in Mansfield at the Holiday Inn.

**Industry-based Survey Fleet Committee**  
**October 2, 2001**  
**Holiday Inn, Mansfield, MA**

Committee Members Attending:

Pat Fiorelli, New England Fishery Management Council; Mike Fogarty, National Marine Fisheries Service, Science Center; Wendy Gabriel, National Marine Fisheries Service, Science Center; Chris Glass, Manomet Center for Conservation Sciences; Linda Mercer, Maine Department of Marine Resources; Earl Meredith, National Marine Fisheries Service, Cooperative Research; Fred Mattera, Pt. Judith, RI; Cheri Patterson, NH Fish and Game Department; John Pappalardo, Cape Cod Commercial Hook Fishermen's Association; David Pierce, MA Department of Marine Fisheries; Kelo Pinkham, Trevett, Maine; Liz Rowell, Charlestown, RI; Bob Tetrault, Portland, Maine; and April Valliere, RI Division of Fish and Wildlife. Staff: Don Perkins and Laura Taylor Singer, Gulf of Maine Aquarium.

Introduction:

Don Perkins opened the meeting by facilitating a round of introductions of the Committee members. He anticipates possibly one or more all-day meetings to complete the Committee's report to the Research Steering Committee and the National Marine Fisheries Service. The next 6-8 weeks will be critical to the success of the project with sub-committees meeting between committee meetings.

Administrative/Communication Issues:

Earl Meredith reported on the Industry-based Study Fleet Committee, a separate committee established to design a complementary project to gather information while vessels fish under a commercial operation. The committee is focusing on electronic software and hardware to collect data. The next meeting is October 25<sup>th</sup> in Woods Hole to discuss electronic software/hardware options. The Research Steering Committee and Regional Administrator have been briefed about both Industry-based Committees and are supportive of the progress being made. Some of the reports from the collaborative research efforts funded by NMFS, including the cod tagging report, are available on the web at <http://www.nero.nmfs.gov/ro/doc/da.htm>.

Congress allocated \$15 million to NMFS (from Department of Agriculture left-over funds) as groundfish disaster relief funds to be used for cooperative research efforts. NMFS plans to spread the funding out over 3 years and focus on establishing a study fleet, an industry-based survey fleet, a cod tagging program and gear modification research. Roughly \$6-7 million has been allocated conceptually for the combined expense of the study fleet and industry-based survey fleet over the next three years. Therefore, the Industry-based Survey Committee is working under the general concept of about \$1 million a year for three years as a frame of reference. The Committee raised a concern that the new budget situation in Washington may affect the funds available for years two and three if NMFS needs to cut its budget and re-focus these funds on current NMFS efforts.

Don presented a flow chart describing the process and timeline for the Industry-based Survey Committee (see attached flow chart).

The Committee expressed concerns about the length of time for the current permitting process and the hindrance this places on any research projects. NMFS is looking at streamlining the permit process by having all cooperative research projects under one NEPA document that is pre-approved. They are also putting together an experimental permit packet to describe the process and discussing how EIS stipulations could be worked out at the proposal level, earlier in the process. The Committee also shared specific concerns about the willingness of NMFS to permit activities in closed areas, which are a key interest of Committee members.

#### Vessel Compensation:

Bob Tetrault reported on the progress made by the vessel compensation sub-committee. The compensation program should be results-oriented to be most efficient. The Maine trawl survey is results-based. They do one hundred 20-minute tows in 26 days as specified by a computerized model that randomizes tow locations. Any day the boat doesn't perform it is not paid. To achieve performance, a complete spare rig is carried on board the boat or in a truck following the vessel. There is another identical vessel to relieve the first in the event of a mechanical problem and shore crew on call at all times; neither has been tapped yet.

Compensation should also reflect the opportunity cost of not fishing. For example, the price for the charter should change over the year depending upon the fish that could have been caught during that time period. It was also pointed out that the wear and tear on gear is greater during research cruises because more and shorter hauls are made than on a typical fishing trip. In addition, more fixed gear gets caught in the wheel working nearshore. Preparation for the trawl survey takes 2-3 days and back-up vessels are needed. On the positive side, there is less fuel cost on a research trip.

The gear for the Maine trawl survey was designed to be used on any "average" vessel so trawl is standardized and can be fished off of other boats.

David Pierce suggested looking closely at the Canadian Sentinel Survey. They have a manual that describes how the survey is conducted and information is also available on the web. A workshop was held in Gloucester two years ago to discuss the idea of using the Sentinel Survey model in the Gulf of Maine. We need to see whether and how the DFO scientific community has used the information from the surveys. It was noted that the Sentinel Survey has a fixed number of boats involved and committed for several years with a monetary penalty if they drop out to assure participation over the years.

The Committee was concerned that the survey being discussed only involved trawlers. However, some questioned the utility of using gillnets and hooks for the survey if they have not been used in the past. Others argued that there are plenty of areas within the Gulf of Maine that cannot be towed and therefore other gear types should be included in a survey design. It was suggested that we could run comparisons of what is seen in random survey vs. what is seen in fixed gear.

The Committee had a discussion about conducting a random stratified survey and the concerns some industry members have about the validity of such surveys because they miss known areas with pockets of fish.

The Committee also discussed training issues for vessels. Bob Tetrault hired a retired captain to use as a liaison with the trawl survey participants and to oversee the research projects. A standardized training program is needed for the survey to include things such as fish handling techniques, data input, etc. In Canada, the fishermen involved in the Sentinel Survey meet periodically to have discussions and re-training.

In the Maine trawl survey, local fishermen are compensated \$200/day for coming aboard the vessel to share their local knowledge about a particular piece of ground. This has worked well to garner information, cultivate local support and identify owners of fixed gear. The Committee recognized the need to bring other fishermen onboard survey vessels to get more people involved with local knowledge. It was also suggested that exchanges among vessels from various parts of GOM would be extremely valuable for communications among fishermen throughout the whole region. This would allow fishermen in different areas to see and appreciate the way others fish and support research.

#### Data Issues:

Cheri Patterson provided a draft chart of the data elements that are used by ACCSP, SeaMap, NMFS, ME/NH, MA and RI. The information has some gaps that will be filled in later. A suggestion was made to separate the elements that can be determined in advance (such as vessel name, size, etc.) so the list is less intimidating and the data that needs to be collected at sea is clear.

The sub-committee on Data Issues needs to address a broad list of questions, including:

- 1) What's the total list of data to be collected?
- 2) How do we want to collect (electronic and paper)?
- 3) Where is data housed?
- 4) How is data made available to others?
- 5) Redundancy? How does this information integrate into other efforts?
- 6) How will the data be used and when?

It was also suggested that cooperation with fishermen should be at both the analytical level as well as the data collection level. The data elements that NMFS, MA and ME/NH already use should be part of the survey data elements.

One Committee member suggested embargoing the data for certain number of years so the data is not used too hastily to make management decisions. Others disagreed with idea of embargoing the survey fleet data. The issues of data review and accessibility should be discussed by the sub-committee, but no entity will be able to control how data is used once it is made available. Although some Committee members called for immediate release of the data (real-time), others cautioned that data should be reviewed before being published to avoid mistakes in data collection at sea.



There was also a concern within the Committee that data will be “sent to a black hole”. Although cautious about re-inventing the wheel and creating a new data-clearing house, some were worried about not having access to data.

#### Jurisdictional Issues:

Don Perkins raised the question to the Committee about how to frame geographical parameters of the industry-based survey – GOM, Southern New England?

It was noted that Congress allocated money, as a result of the collapse of groundfish, to address “Northeast groundfish” leaving a broad range as to how that is defined, but the primary focus is on New England groundfish.

Some members of the Committee were involved in early discussions when the issue was more narrowly defined as GOM codfish. However, now southern New England yellowtail flounder are in bad shape and would benefit from research. Closed areas were also suggested as an addition to the mix of research areas because of the fear that we are looking at more closed areas in southern New England as well as in the GOM.

Other members of the Committee felt that the problem is not just within GOM, but a groundfish problem with cod and yellowtail being the most significant. Yet others voiced concern that a multi-species approach is necessary instead of focusing on cod and yellowtail species. The gear type used for survey will influence whether looking at a suite of species or a specific species.

The Committee discussed the scientific questions that the industry-based survey is trying to answer. Some Committee members warned about getting too hung up on the question to answer vs. achieving a process that people feel a part of for this pilot phase of the project. This project is about collaborative science working – both good science and good input by industry into the process.

It was noted that the study fleet will be getting information outside of closed areas and perhaps the industry-based survey effort should focus on closed area monitoring. A discussion about experimental permits in the closed areas followed. It was recommended that any closed area project have a sound study objective and have the NEPA impacts covered upfront.

The Committee suggested that NMFS redefine the work as scientific research instead of experimental fisheries to avoid the permitting issues currently confronting the scientific community around the Gulf of Maine.

## Industry-based Survey Prototype

Linda Mercer presented a draft handout (attached). Changes were suggested by the Committee and are presented in italics.

The Committee discussed random stratified samples versus transects. The Canadian Sentinel Survey includes random stratified and 20 selected sites. Fishermen in the past have been confused that some of the survey sites are in areas where they wouldn't expect to find fish. However, now the "core areas" are shrinking and fishermen have an easier time understanding sampling in areas that may not currently have fish. How the data will be used once it has been collected may help clarify the method used for data collection.

Don noted that there is not enough money to do all the objectives over the GOM/ Southern New England area; what are the questions that need to be addressed?

It was suggested that the survey work be done in areas that are open and closed (i.e. rolling closures). Would like to know if all the fish are being caught when area becomes open. Surveys with gillnets and long lines would be good addition to bottom trawl survey work. Also need to take into account the other information being collected by the study fleet and cod tagging projects.

### *Scope of Survey:*

- A. Gulf of Maine Cod – pre/during/post closure
  - a. ? movement – allocation issues
  - b. ? data among fixed gear
- B. Spring – mimic NMFS strata – 3 miles to 80 fathoms; 5 boats in three different areas, groups; long term
- C. What makes "cores" the focus during contraction? – closed areas
- D. North Shore
  - a. Nantucket Shoals area avoided by NMFS survey
- E. Rhode Island
  - a. State focused on Narragansett Bay
  - b. Need to expand 3-20 miles
  - c. Closed areas for yellowtail are proposed and would be good to survey in advance
- F. State Foci
  - a. I.D. strate/grid/#stations
  - b. Budget!
- G. Monthly transects out of ports along coast

### *Key Issues:*

- Processing biological samples
- Data analysis
- Not really random - rules for deviation

## **Closed Area Prototype**

David Pierce presented a draft handout regarding closed areas (Goals and Objectives section attached). Changes were suggested by the Committee and are presented in italics.

### *Questions to be addressed:*

- Are rolling closures having a conservation impact or simply delaying harvest?
- Are the boundaries and close/open dates the right ones?
- How are closed areas functioning?

### *Ideas:*

- Re-stratify by industry perception. Re-stratification could happen if everyone identified their hot spots so sampling could be done on high, medium and low spots.
- Transects to assess changing closures?
- Compliment study fleet data with closed area data.
- Be aggressive with 2-year program vs. 3 years with funds spent in both GOM and Southern New England.
- Link closed area survey with state/NMFS surveys.
- Monthly transects/ port to port/ track closure and management measures.
- Some NMFS monitoring already goes on in the closed areas, so it would be good to monitor the rolling closures.
- Before and after comparisons and more intensive sampling in permanent closures.
- Before, during, after rolling closures.
- In order to design and, most notably, permit a closed area project, the project goals/objectives must be rigorously defined. Furthermore, a “before” data set must be developed in order to provide a point of comparison of current closed area findings vs. pre-closure findings. NMFS data from trawl survey and other sources probably have sufficient data points to provide such a baseline.

Pat Fiorelli gave an overview of the closed areas implemented by the New England Fishery Management Council (notes attached).

It was mentioned that the Canadians have released information on seasonal closures and found that they were not successful because of intensive harvest when re-opened. A closed area survey would need to look at spill-over from closed areas to see if there is really any benefit to fish stocks and industry. Because migration rate in and out of closed area would have an impact on “success” of closed area, perhaps this work should be integrated with cod tagging projects?

## **Next Meeting**

The next meeting is scheduled for Tuesday, November 20 in the 495/Massachusetts area. At that meeting, draft reports from each sub-committee will be made with recommendations for the Committee.

~~Nearshore~~ Industry-based Survey *for New England Groundfish Species* for the  
Gulf of Maine  
Draft 10/2/01

**Goal:**

To expand data collection for fisheries management in the Northeast through the use of scientifically designed industry-based surveys.

*To compliment NMFS/States surveys.*

**Objectives:**

- *To spend resources responsibly and implement successfully during pilot phase and grow program in the future.*
- To collect supplemental data on the temporal and spatial abundance, distribution, and size composition of species for fishery assessments and management;
- To develop partnerships and improved communications ~~between~~ *among* scientists and the fishing industry;
- To collect data to help refine essential fish habitat designations and spawning/area closures;
- To ~~develop~~ *improve* recruitment indices for groundfish and *develop for* other species such as lobsters;
- To collect biological samples for age, growth, reproduction, trophic dynamics (*if resources are available*);
- To develop cost-effective means of data collection. (*Meaning both electronic data collection and use of fishing vessels as platforms.*)
- *Outreach to other industry/science/environmental stakeholders.*
- *Define use of data and accessibility.*

**Planning:**

1. Establish a scientific-industry planning team.
2. Define survey areas.
3. Identify personnel needs and participants.
4. *Design methods:*
  - a. *depth-stratified random trawl survey,*
  - b. *transects,*
  - c. *random and selected,*
  - d. *edge of contour vs. straight line tow*
5. Determine appropriate *gear requirements* (e.g., net design).
6. *Plan data collection methods. (look at Canadian methods).*

**Implementation:**

1. Hire project coordinator(s) and other needed personnel.
2. Purchase equipment.
3. Public outreach.

4. Train fishermen in the collection of biological and environmental data.
5. Conduct trawl calibrations.
6. Develop data management system - data processing, storage, analysis, distribution.
7. Conduct complimentary surveys (Spring and Fall) to the NMFS and state surveys.
8. Analyze results.
9. Produce data summaries and communicate results to scientists, managers, and the fishing industry.

***Vessel and equipment needs:***

- Commercial trawlers - number to be determined
- Nets with liners
- Environmental sensors
- Biological sampling equipment:
- Electronic measuring boards and scales
- Notebook computers to download data
- Electronic logbooks (to be developed)

***Personnel needed:***

- Program coordinator
- Vessel captains and crews (#?)
- Scientific coordinator(s)
- Technicians/observers (#?)
- Data manager(s)

**Expected Products:**

1. Size and species composition
2. Distribution of species and information for EFH
3. Indexes of abundance
4. Biological samples
5. GIS maps

Prototype Project Detail Exercise – Closed Areas  
Draft 10/1/01

Goals and Objectives:

- ~~Develop a partnership between fishermen and scientists to~~ Improve stock assessments for groundfish through surveys in areas where commercial catch data are no longer available (seasonally or permanently) due to closures.
- Develop a partnership between fishermen and scientists to join traditional knowledge of fishermen to scientific expertise and to promote understanding.
- Obtain more precise information about relative abundance and distribution of groundfish in areas seasonally and permanently closed to commercial groundfish fisheries especially at times when state and federal trawl surveys do not occur or are infrequent (*i.e., greater seasonal coverage*).
- In seasonally re-opened areas, evaluate impact of fishing on groundfish abundance after closures of different duration.
- Assess effects of closures on interpretation of state and federal bottom trawl survey abundance indices, *i.e.*, changes due to availability of real abundance.
- Evaluate boundaries and timing of closures relative to fisheries management objectives and rebuilding targets.
- Collect biological samples, *e.g.*, for age, growth, and reproductive state.
- Survey the “core areas” of Gulf of Maine cod abundance at times when and in locations where abundance is expected to be consistently highest and less variable from year to year.
- ~~Demonstrate to fishermen that managers and scientists appreciate fishermen’s perspectives about fish abundance and distribution by responding to their commonly held view that to properly survey fish abundance, samples must be obtained where and when one would expect to find fish (*i.e.*, large catches).~~
- Establish a new and flexible approach for permitting industry-based surveys in closed areas free of the hindrances of the experimental fisheries permit process.
- *Establish baseline information on environmental factors: habitat as well as species.*

**Industry-based Survey Sub-Committee  
Long-term Survey and Data Management  
November 9, 2001  
New Hampshire Fish and Wildlife, Durham, NH.**

**Attendees:** Wendy Gabriel (NMFS), Rob Johnston (MA), Linda Mercer (ME), Cheri Patterson (NH), Don Perkins (GMA) and Liz Rowell (RI).

**Meeting Agenda:**

Long Term Industry-based Survey:

- 1) Where should survey take place? (scope of survey)
  - A. Gulf of Maine Cod pre/during/post closure
    - a. ? movement allocation issues
    - b. ? data among fixed gear
  - B. Spring mimic NMFS strata 3 miles to 80 fathoms; 5 boats in three different areas, groups; long term
  - C. Nantucket Shoals area?
  - D. Expand state surveys 3-20 miles?
  - E. Proposed closed areas for yellowtail?
  - F. Monthly transects out of ports along coast?
- 2) What method(s) should be used to conduct survey?
  - a. depth-stratified random trawl survey
  - b. transects
  - c. random and selected
  - d. edge of contour vs. straight line tow
- 3) What are the appropriate gear requirements (e.g., trawl net design, gillnet design, hook standards)?
- 4) How will data be collected and analyzed (look at Canadian methods)?

Data Management and Analysis:

- 1) Who is responsible for data management and analysis? Who will take raw data and edit it for mistakes? Who will transcribed data? How will data be transmitted to its final destination? How/who will analyze data?
- 2) Where does data go (where is data housed)? How is it made available to others? How, when and where will data be accessed by management, states, industry, interested public? Will raw data be made available to anyone what about confidentiality aspects?
- 3) Redundancy? How does this information integrate into other efforts? How will we maximize

and collate the data that will be gathered from other sources?

4) What measures can be taken to minimize risk of shoddy interpretation of data made more accessible to interested parties?

### **Long Term Industry-based Survey Discussion Summary:**

#### **Gulf of Maine Summary:**

- Proceed with development of a nearshore survey addressing waters where traditional fishing has occurred outside of state waters out beyond 50 fathom curve in waters from 42N to 44N.
- Design survey as random-stratified survey with modest, targeted adjustments to accommodate areas of particular concern to industry, science and management.
- Involve 5 vessels (2 MA, 1 NH, 2 ME) completing 5 days of surveys (minimum of 4 stations/day, possible 6-7 depending on proximity and weather) covering 100+ stations in January, February, March, April, May and possibly June.
- Personnel requirement includes: (1) one or two (ME/MA) shoreside project managers; (2) five trained observers/samplers with crew assisting on deck for each survey; (3) data entry and quality control; (4) data analysis.
- Address concerns about speed of data turnaround, access and availability by: (1) discuss with industry what specific information they want through web published survey results; (2) fund upfront programming of database that will accept vessel data, provide for rapid data validation, format vessel data for immediate export to GIS-based data display published to web, and format website to accept highest priority industry queries; (3) provide quick display of preliminary data results once validated; (4) archive data with NMFS and possibly ACCSP.
- Advance implementation of survey by hiring assessment/modeling talent to focus on technical design of survey (e.g., M. Fogarty? J.J. McGuire? Yong Chen? etc.).
- Involve industry actively in review (vs. as passive observers) of survey analysis/results as part of NMFS review process during summer following Jan-May/June survey period.

#### **Gulf of Maine Issues (volunteer tasked to follow-up in parentheses):**

- Include June to cover spawning period? (Wendy)
- Day-only or Day/Night survey operations? (Mike and Vessel Committee)
- Grid coverage required to provide useful information on closed areas? (Wendy/Mike)
- Management of intercalibration issues between 5 vessels? (Laura on Canadian model) (Vessel Committee on standardized nets, spreaders, power, towing speed, set and haulback rates, etc.) (Mike on method and paired tow requirements to maintain five vessels' calibration)
- Preprogramming of survey data (Laura on Canadian model) (Bob Branton at DFO and Dale Keiffer on ARC IMS experience for Census of Marine Life)
- Develop vessel RFP (size, gear, maintenance, long-term commitment) and terms to sustain long-term commitment (incentives to stay involved vs. penalties for dropping out). (Vessel Committee) (Laura on Canadian practices)
- Outline scope of work to complete technical design of survey (Mike)



- ACCSP option still fuzzy do to uncertainty of their timeline/implementation.

#### Southern New England Summary:

- Liz conveyed continued industry concern about potential closure of three 30' squares in eastern Long Island Sound.
- Why has Georges Bank yellowtail stock done so well and Southern New England stock declined? Fishing pressure or environmental/pollution factors?
- Southern New England industry is more interested in Study Fleet and real-time data than Industry-based survey.
- Interest in surveying Lightship closure to assess efficacy.

#### Southern New England Issues:

- Need to involve April in detailed discussion about yellowtail oriented survey.
- Identify three 30' blocks under discussion and determine whether their closure is likely.
- Identify Study Fleet intentions in Southern New England.
- Defer further discussion until more RI committee members involved.

#### Data Discussion Summary:

- Data access by industry, scientific community and states remains a strong concern. Data archiving remains a strong NMFS concern.
- States, NMFS, ACCSP and third party data storage are all options.
- Those present seemed to conclude that rapid display by a third party in a GIS format followed by archiving at NMFS is the best course at present.
- Data structure should be designed with NMFS input in order to assure easy importing in to NMFS archive (i.e., use NMFS data tables).
- Third party would work with industry and states to develop a process for collecting vessel data, validating its accuracy, serving data summaries on a GIS-based web interface, animating data to show shifting patterns over time, and responding to inquiries from industry and science.
- The IBS Committee needs the support of a database person to get the data structure and interface work done.
- We should test with industry the notion of rapid summary data display by a third party and archiving with NMFS.
- ACCSP vision makes sense, but they are under-funded and implementation timeline is uncertain; their five current modules do not include fisheries independent data; they do not have GIS capability.
- Need to confirm with NMFS (Joan) that they have space to archive IBS data. (Wendy)
- Need to draft a detailed job description for the third party data collection, validation, web display and export for archiving at NMFS.

**Industry-based Survey Fleet Committee**  
**November 20, 2001**  
**Holiday Inn, Boxboro, MA**

Committee Members Attending:

Pat Fiorelli, New England Fishery Management Council; Mike Fogarty, National Marine Fisheries Service, Science Center; Wendy Gabriel, National Marine Fisheries Service, Science Center; Chris Glass, Manomet Center for Conservation Sciences; Tom Lyons, Hampton, NH; Linda Mercer, Maine Department of Marine Resources; Earl Meredith, National Marine Fisheries Service, Cooperative Research; Frank Mirachi, Scituate, MA; John Pappalardo, Cape Cod Commercial Hook Fishermen's Association; Kelo Pinkham, Trevett, Maine; Liz Rowell, Charlestown, RI; Bob Tetrault, Portland, Maine; and April Valliere, RI Division of Fish and Wildlife. Others Attending: Rob Johnston, MA Division of Marine Fisheries; John Williamson, New England Fisheries Management Council; Chris Kellog, New England Fisheries Management Council. Staff: Don Perkins and Laura Taylor Singer, Gulf of Maine Aquarium.

Don Perkins opened the meeting with a round of introductions and an overview of the agenda for the day (see attached).

Long-Term IBS Sub-Committee Update – Linda Mercer

The sub-committee met on Friday, November 9<sup>th</sup> to discuss the details of a long-term industry-based survey in the Gulf of Maine and Southern New England as well as data management issues. Please see attached agenda with detailed questions addressed by the sub-committee and the meeting minutes.

The sub-committee decided that five vessels (2MA/1NH/2ME) surveying one week each month from Jan to May/June in a random stratified survey with modified fixed stations is the appropriate design for a Gulf of Maine survey. There is a need for local conversations to target industries' areas of particular concern in modified industry-selected stations. This is an important concern to industry. The sub-committee was discussing up to 50% data from industry selected sites.

The personnel for the survey would require: project managers, sea samplers and crew, data entry (QC) and data analysis.

The survey data should be made available on the web and include GIS-based formatting designed upfront. Pre-design templates should be designed to easily input data and display easily in a web-based format immediately with pre-determined queries from the fishermen of key areas of interest.

The technical aspects of design are still in question. The sub-committee will need technical support from stock assessment scientists and others involved in survey design to focus on specific technical design of survey. Experts are needed to flush out design of the survey upfront in design phase to be sure the design is in-line with other surveys. The sub-committee is

interested in making sure the information is used in the assessment process and therefore looking to technical expertise to design the survey.

Outreach is an important component of successful project implementation. The sub-committee suggested using local contacts and effort to work through with industry the survey details.

The issues raised by the full Committee for the afternoon discussion included the range of the survey (50 fathom, 80 fathom?) and thoughts on shoreside management. Members of the Committee wanted to refine the data needs required to define the management adjustments currently being implemented and to gain more understanding of local variations in stock. In addition, the Committee discussed using the Study Fleet electronic data solution as the model for the Industry-based Survey data collection.

### Southern New England Project Ideas - April Valliere

#### *1) Proposed Closures for Yellowtail*

Rhode Island is concerned about the yellowtail stock and the impact of the 30 minute blocks (84/85/86) being considered for closure to achieve a 65% reduction in mortality. Stock estimates for yellowtail are not based on survey data, but on landings data, which results in a big gap in information. It is sensible to go in and monitor areas before closure so you have a baseline and continue to monitor after the area is closed. If these areas are closed, they will be closed to all gear that can catch groundfish resulting in a huge impact on coastal fishing pressure due to shifts in effort. Displacement issues are a major concern for Rhode Island.

#### *2) Evaluation of Nantucket Lightship*

Another area of interest for Southern New England is what impact the current Nantucket Lightship closure has had on the yellowtail stocks. What happened to the yellowtail stocks within the Nantucket Lightship? With potential additional closed areas being considered, what is the impact of the current closure on yellowtail? A potential design would be a spring and late fall time frame, Feb-March to Oct-Nov; with a minimum of two months,

Rhode Island conducted a mesh selectivity study, but the permit was so late that yellowtail were not found. Current plans are to conduct another survey next March to look for more yellowtail.

#### *3) Transects Out to the 50 Fathom Line*

East/west versus North/South transects? Closure will affect winter time, summer flounder fishery more than yellowtail in Massachusetts. Because of this, interested in having some study like this occur both in and out of closed blocks. Perhaps this would lead to other better, more finite zones to protect juvenile yellowtail. April would like to talk more to industry about their thoughts on locations for juveniles and timing of a transect survey.

#### *Southern New England Issues:*

- 1) Current closed area or proposed closure?
- 2) Determine sampling area by fish behavior versus currently proposed squares?
- 3) Industry discussions and commitment to study.
- 4) Use of NMFS survey data to define area.

- 5) Worth considering the mid-Atlantic stocks of yellowtail: a) what is the stock boundary?;  
b) has the stock decreased or moved?

*Potential Question* – Nantucket Lightship was closed for yellowtail at the same time as Closed Area #2. Closed Area 2 was useful for yellowtail stocks while the Nantucket Lightship was not. Why haven't the yellowtail stocks in the Nantucket Lightship and vicinity recovered?

#### Update from NMFS – New England Region – Earl Meredith

The Study Fleet Committee has met twice. The most recent meeting in Woods Hole focused on electronic hardware data collection systems. The conclusion drawn from the meeting was that no system exists that can be used right 'out-of-box' for the study fleet. An array of technologies should be developed based on the minimum data needs. NMFS will define the minimum data needs and let the market produce the technologies needed for various users. The technology used will depend on the type of fleet. The Committee concluded that they don't need real-time data, but data can be dumped while coming into shore after a fishing trip.

The Study Fleet Committee will be discussing three pilot projects at their next meeting on December 10: 1) large vessel fleet out of New Bedford; 2) small boat gillnet, hook and line out of Cape; and 3) larger trawlers from mid-mass to Maine for larger trawlers; with 5-10 vessels in each pilot area and a mix of gear types. The Committee is hoping to get vessels on the water in early spring 2002 and early winter 2002/2003.

Southern New England Committee members expressed their interest in getting involved in the study fleet. The focus of the study fleet is not solely on Georges, but details have not been discussed thoroughly. The Committee is looking at an array of technology and vessels to see what works first and building up the program from there. The initial goals are to work on developing the technology, get the industry involved and collect useful data.

When asked about the connection of the study fleet to the vessel management system, the response was that VMS will be an optional compliment to study fleet (i.e., Paul Rago's work with scallop fishermen). However, this data was unique to the closed area program so there are still a lot of blank spaces that need to be filled in.

Members of the Industry-based Survey Committee suggested that NMFS not have too many methods for industry, keep it simple. The study fleet is modeling its data gathering after the way the IRS collects information. You can file your tax return electronically, but the IRS has determined the format for you to follow. No one system is currently out there so the Study Fleet is looking at defining the data elements and leaving the technology to industry sector and creating a data transfer method that is "idiot proof". Perhaps in the future for economy reasons, it may be best to design a Thistle-type box; this way the industry would only have to learn one system whether they are doing a study fleet or a IBS.

### Canadian Sentinel Program – Laura Taylor Singer

A presentation was made about the Canadian Sentinel Program based upon a recent DFO workshop in Moncton, N.B that was part of a national reviewed of the program.

The Committee discussed if a research set aside could be considered for the industry-based survey work in the US. This would require a hard TAC or days-at-sea to allocate to research and a good portion of the industry would need to get behind this management change. The mid-Atlantic is using a research set-aside but they are all under a TAC already.

### Data Issues Update – Linda Mercer

Cheri Patterson is finishing up the collection of data lists from NMFS, ME, NH, MA, and RI. The sub-committee on data met and discussed the need for rapid turnaround of data. The concerns about speed of data turnaround, access and availability can be addressed by: (1) discussing with industry what specific information they want through web published survey results; (2) funding upfront programming of database that will accept vessel data, provide for rapid data validation, format vessel data for immediate export to GIS-based data display published to web, and format website to accept highest priority industry queries; (3) providing quick display of preliminary data results once validated; and (4) archiving data with NMFS and possibly ACCSP. Raw data would be accessible after data had been audited with no conclusions.

The sub-committee suggested using NMFS template so the data could be archived at NMFS. An initial quality control would need to take place when data comes off boat but then a sub-set of the data could be merged and put on web to address the top 25 immediate questions from the fishing industry about the project. Other data would be further refined and analyzed. What questions are industry and managers interested in getting rapid information about and what data is saved for detailed analysis?

Bob Tetrault would like to see physical factors included in data reporting (i.e., tides, moon, weather, etc.) including predicted versus actual observations.

The question was raised whether Maine, Rhode Island and New Hampshire use NMFS survey protocols. Massachusetts uses NMFS platform and is therefore well integrated into their database. The training time for techs to guarantee quality control can be time consuming (6 months). Rhode Island had an agreement with NMFS from 1983 – 1996. From 1996-2001 RI worked with ACCSP and now looking to own system under new licensing structure.

Flow of Data: data entry – data audit – data display – data archive

### Vessel Issues Update

The Committee discussed the issues surrounding vessel participation and selection. The Committee is looking for long-term commitment and questioned how do build in incentives for continued participation or penalties for dropping out of the program.

How do you standardize gear or do you? Frank Mirachi advocated for a diversity of gears to identify biases that may exist in various gear types. Diversity enhances participation and increases support and a rough bottom calls for different types of gear. He suggested a replicate or comparison study using other gear types; find ways to experiment and find common, acceptable ground (hooks/gillnet/rawl). Closed areas may best be monitored with hook and line.

Training for participating vessel crew and observers will need to be on-going. This will be critical if crew is used to assist the sea samplers. One suggestion was to award the contract for work contingent upon training.

John Williamson discussed his current NEC Project with UNH. There is an advisory board of fishermen, academics and others guiding the project. They are looking at two 3-day models over 2 1/2 year period: 1) fishery science and 2) fishery management. The training will be designed for 15 fishermen and 5 others. The goal is to launch the first program in April 2002.

The issue of how to involve more vessels and local knowledge was discussed. One suggestion was to consider putting together a team of other fishermen who don't have qualifying boats and use them as observers, data collection, local knowledge, etc.

Project management was also discussed by the Committee. The Committee thought the industry-based survey will need two shore-side project managers and at least one observer/data crew, depending on the final design of the project. Part of recommendation from the Committee to NMFS should include who should be the implementation team/committee and how they will oversee the project. The recommendations from the Industry-based Survey Committee will go to the Research Steering Committee and the NMFS Regional Office. Earl Meredith encouraged the Committee to include as much detail as possible with specific recommendations, including an outline of project implementation. He also noted that the NMFS budget for cooperative research in northeast region will most likely be \$3.75 million for FY2003. This is below the budget requested, but is in addition to the \$15 million for cooperative research that has already been allocated.

## **Afternoon Discussion: Recommended Project Design and Implementation Discussion**

### **Southern New England Industry-based Yellowtail Survey Discussion**

A more detailed discussion of Southern New England's research needs continued in the afternoon Committee session. The short-term needs include a reaction to pending management closures; what is going on in those areas now and how would a closure be effective? The long-term needs are focused on what happened to Nantucket Lightship closed area. April Valliere proposed putting out a strawman for Massachusetts and Rhode Island to consider.

The Committee discussed whether a one-year survey is enough or is there a need to create a longer term baseline. The timeframe discussed was a late spring, early fall survey. The use of VTR information to get a better sense of what is in open areas now was considered, but it was decided that the logbooks are not filled out accurately so the data is not useful and there is limited sea sampling.

NMFS is not seeing the Nantucket Lightship as devoid of data over a longer time series. They have seen an increase in average size and therefore weight per tow. The dominant increase in biomass is growth. There are dramatic differences in the oceanographic conditions between the Nantucket Lightship and Georges Bank. Transport in the Nantucket Lightship area is to the south for yellowtail when they are in larval stages so transport is out. This is in contrast to circular transport for Close Area #2. The Nantucket Lightship closed area may be producing favorable conditions to reproduction but the larvae may be going out of the site. Is the Nantucket Lightship a broodstock area for Southern New England and the mid-Atlantic? Does the age class structure within the Nantucket Lightship indicate lower larval success?

The idea of a “Then and Now” project was discussed with the question being raised about the data available for the Nantucket Lightship before closure to use NTLs pre-closure data as the context. Other questions raised included: 1) the correlation of low water temperature and dominant year class (Phil Haring study); 2) the age structure in and out of Nantucket Lightship; lots of juveniles or no juveniles? And 3) the change in species complex; is yellowtail being out competed? Where are the yellowtail now in relation to environmental conditions?

The Southern New England sub-committee needs to decide among:

- 1) Relative abundance (before/after; size structure) Vs.
- 2) Environmental impacts- long term (temperature data) Vs.
- 3) Trophic (stomachs)

*Potential Questions* - How has the population density and size structure within the Nantucket Lightship and outside the Nantucket Lightship changed since the Nantucket Lightship has been closed?

This would include addressing abundance inside/outside the area, size structure and recruitment. One suggestion was to get a fine-scale mapping effort within Nantucket Lightship. The current survey data is probably the best data set available for before the closure. Use trawl data as basis with sea sampling to enhance the information. The sampling season would start in autumn to pick up recruitment events and may include gear with a 1/2 inch liner. The spring would give you maturity stages of the females; both seasons would give relative biomass abundance; a liner inside would mean more than one sampler (2-3 people).

A hybrid approach to sampling the Nantucket Lightship may include a random stratified sample with fine mesh, less sampling and additional transects with commercial gear to seek out high concentrations for density and size structure.

How would NMFS design a program to assess closed area effect and success? A grid design with the number of stations and fineness determined by the amount of funds available was suggested. Start within Nantucket Lightship and then expand out beyond borders for fine scale OR do broad brush approach of the whole area with less density of stations. NMFS currently has roughly 30 stations within Southern New England and then four within the Nantucket Lightship closed area. The design would depend upon the use of resources available and how the information from the study fleet could be used. Define question clearly in writing and then develop survey with money available.

A sub-committee of Rhode Island and Massachusetts will define the question for Southern New England through e-mail and with industry input.

#### Gulf of Maine Industry-based Survey Discussion:

*Potential Question* - What is the fine scale distribution and size composition of cod (and other species) in time and space (Jan- May/June) in the western GOM?

The rolling closures were to catch spawning aggregations of fish and to limit harvest, although it was not clear among the Committee which objective was the initial driver behind the closures. Frank Mirachi would like to see a more fine-tuned description of future timing of closures in space and time.

The Committee discussed the potential survey design: How dense is dense enough (spatially) for industry? What scale? Industry would like to refine size of closures. The survey design needs to serve two masters – fishermen and scientists.

Sissinwine and Jay Burnet did a mapping effort a few years ago based on fishermen's knowledge and the suggestion was made to use that map as a template for a stratified design. Define attributes for the strata (depth and bottom type) and then randomly sample within those areas. The suggestion was made for 10'squares. This would increase sampling density because 15 30'squares is equal to 135 10' squares.

#### *Potential Questions -*

- 1) What is timing and extent of spawning activity throughout this area through the period?
- 2) How does the timing of the current closures relate to presence of spawning cod?

There was a discussion about the goal of survey. Some believe it is not to target specific management issues but look more broadly at stock – spawning; species structure month-to-month; and juvenile structure. A suggestion was made for once/month transect design with additional targeted assessment of spawning areas. However, NMFS is not just interested in going to the hot spots because they are seeing “core areas” where you find fish, these areas are just getting smaller.

The industry members advocated for a better understanding of what fish are doing on a finer scale with some flexibility in conducting the tow along cod bottom instead of a straight line to chase an edge. Is the goal cod sampling or a cod survey? There was disagreement among industry and science members about the best sampling design. NMFS abundance index is trying to be consistent over time and therefore there is a fear that different knowledge of fishermen would bias where the survey goes over time. One suggestion was to design a study to look at variability between random straight line method and random fishermen's technique method (i.e., Bob suggestion to let fishermen fish within the random spot in any manner they chose).

The information is not to rebut NMFS trawl survey but to get fine-scale information about cod; managing at different spatial levels. One suggested design was a traditional stratified survey



within high cod areas (i.e., using the Jay Burnett maps). Include fish behavior in decisions on where to tow within 10-minute random blocks. Stratify survey by depth, habitat, behavior?

Potential sample design could include a grid or random survey stratified by depth, bottom, and/or behavior patterns. A set of standard random stratified tows could be done with a set of fishermen choice tows as well.

The Committee grappled with the decision to address abundance versus distribution questions...

The areas of focus for the Committee included: When cod spawn and where...

- Distribution
- Structure
- Spawning
- Biological information
- Habitat
- Presence or absence (Abundance information is secondary.)

This information would require a longer term survey to really get a handle on the information. The timeframe between January and June was o.k. with the Committee members. The Committee discussed how to select gear types and determined that the ability to tow or not tow the bottom would be a driving factor. For example, Minots Light Ledges is best suitable for hook, Cashes for gillnet (although the question was raised if gillnets are too selective for survey purposes), and inside areas are best for fixed gear.

A discussion among the Committee ensued about the original intent of Industry-based Survey Committee and where the Committee is now. The previous focus of the Committee was toward an index of abundance to add to the NMFS assessment process. However, some Committee members are now advocating for fine-scale information on distribution ASAP and not have parallel abundance index now arguing that we will automatically converge to this over time as fishermen and scientists collaborate.

**The next meeting is scheduled for January 10, 2002 at the Holiday Inn in Boxboro. Massachusetts.**

**Industry-based Survey Fleet Committee**  
**January 10, 2002**  
**Holiday Inn, Boxboro, MA**

Committee Members Attending:

Pat Fiorelli, New England Fishery Management Council; Mike Fogarty, National Marine Fisheries Service, Science Center; Wendy Gabriel, National Marine Fisheries Service, Science Center; Linda Mercer, Maine Department of Marine Resources; Earl Meredith, National Marine Fisheries Service, Cooperative Research; Frank Mirachi, Scituate, MA; Cheri Patterson, NH Fish and Game Department; Kelo Pinkham, Trevett, Maine; Liz Rowell, Charlestown, RI; Bob Tetrault, Portland, Maine; and April Valliere, RI Division of Fish and Wildlife. Others Attending: Nick Anderson, National Marine Fisheries Service, Cooperative Research and Rob Johnston, MA Division of Marine Fisheries. Staff: Don Perkins and Laura Taylor Singer, Gulf of Maine Aquarium.

Don Perkins opened the meeting with a round of introductions and an overview of the agenda for the day (see attached).

NMFS Cooperative Research Update:

Earl Meredith reported that the National Marine Fisheries Service (NMFS) has \$2.75 million dollars in its budget for nationwide support of cooperative research. In addition, the New England Region has \$3.75 million in the 2002 budget to support cooperative research projects through the New England Fisheries Management Council's Research Steering Committee. The Northeast Consortium, administered out of UNH, received \$5 million in funds for 2002.

NMFS is still working on allocating the \$15 million budgeted last year and intends to spread those funds out over three years. The short-term projects were allocated \$2.11 million in 2000, \$1.79 million 2001 and will stay around \$2 million in 2002. The other funds will be allocated toward the industry-based study fleet, the industry-based survey and cod tagging.

November 20<sup>th</sup> Meeting Summary and Discussion:

Laura Taylor Singer provided a summary of the November 20<sup>th</sup> IBS Committee meeting and discussions that followed. At the last meeting, the Committee started the day discussing a long-term industry-based survey for the Western Gulf of Maine to move toward a relative abundance of cod (and other groundfish) in the region. However, the meeting ended with the discussion focusing on fine-scale distribution of cod (and other groundfish) within closed areas. The Committee did not come to a consensus about the question(s) around which they were trying to design a survey. In the intervening weeks, three potential questions were circulated to get feedback and resolution from the Committee. There was no resolution from the Committee regarding where to focus, although all three questions were supported. The three questions were:

- 1) What is the fine scale distribution and size composition of cod (and other species) in time and space (Jan- May/June) in the western GOM?

- 2) What is the relative abundance, temporal, and spatial distribution of cod in the areas of the rolling closures?
- 3) How has the population density and size structure within the Nantucket Lightship and outside the Nantucket Lightship changed since the Nantucket Lightship was closed?

The Committee discussed their thoughts since the last meeting. Frank Mirachi stated he has always advocated for a fine-scale distribution study to avoid the idea of a dueling survey with NMFS. The random stratified design of the abundance survey would not allow cooperative work with fishermen. There are more important management needs than how many fish; we need to know spawning, age structure, etc.

April Valliere reported that she had discussions with fishermen after the last meeting and Rhode Island has changed its focus a bit from the last meeting. She has two draft proposals that deal with Southern New England yellowtail – a short-term gear modification project and a long-term survey to look at the age structure and distribution of yellowtail in Southern New England area. The Nantucket Lightship is no longer the focus. Mike Fogarty discussed a planning letter regarding yellowtail age structure, distribution and tagging that the Center has submitted to the Northeast Consortium.

Bob Tetrault voiced his concern that recent court developments should not drive the Committee's actions, but Congress will be looking for results from the industry-based survey project. Frank reinforced the need to be proactive and yet not reactive.

Mike Fogarty suggested that the three questions are not exactly separable, but that the Committee needs to make a decision about the spatial resolution/scale and the key species. If the Committee wants to look at closed areas, that would be one type of project design. However, if the Committee wants another measure of abundance for the assessment, that would be a different design. Fishermen's knowledge can be used to define strata within which to randomly stratify.

Mike suggested the following over-arching goal for the Industry-based Survey:

**What are the spatial distribution patterns of key resource species and what is the optimal design of area/time closures to protect these species to meet fisheries management goals?**

The Committee was concerned about the uncertainty around multi-year funding because the relative abundance work would require multiple years of survey work. Linda Mercer stated that distribution patterns may change annually, so it would be important to keep this going over a series of years as well. If a survey for distribution is done on a sufficient scale, you will get abundance indices too over time.

Bob advocated for short-term results to share with Congress and fishermen who need to see results to stay involved. Frank pointed out that when fishing pressure changes, fish patterns change, so it is important to continually monitor what is happening, arguing strongly for long-term duration of whatever the Committee decides to do. There is also a change in species composition over time that argues for a long-term survey.

Earl Meredith noted that in recreational species work, he has started with a “shot-gun” approach to the initial survey design and then worked toward a more refined design. He suggested looking at what information we have and then design survey to give weight to areas where the resource is found.

The Committee made the following changes to the over-arching goal:

**What are the spatial and temporal distribution patterns of key resource species and what is the ‘optimal’ to inform the design, implementation and evaluation of management measures (pre, during and after) area/time closures to protect these species to in meeting fisheries management goals?**

Frank reiterated that the above statement should not be interpreted to mean that time/area closures are a good management tool, but one of many tools to be evaluated. Mike concurred that there have to be other management measures in place as well and he would put less stock in seasonal closures and more on semi-permanent closures.

The Committee determined that the two key species being considered are Gulf of Maine cod and Southern New England yellowtail to focus the questions, but surveys will include data on other species as well.

Review/Refine IBS Questions:

**1) What is the fine scale distribution and size composition of cod (and other species) in time and space (Jan – June) in the Western GOM?**

The Committee discussed how to define Western GOM and what is meant by fine-scale. How fine-scale do you have to sample to be able to defend to management? Mike suggested that for fine-scale question, the Committee would need to focus on smaller areas (i.e. closures or nearshore area). Sampling could also be done disproportionately on areas of high interest. The key is to design the survey to have scientific validity and fishermen credibility.

Cost will also be a factor and one suggestion was to define the cost of each station and then figure out how many stations the Committee can afford.

It was suggested that the stations could be stratified by various variables – habitat/spawning/etc. The industry should identified spawning grounds. However, Rob Johnston commented that spawning may not be the way to go because it complicates the original distribution questions; are we trying to get at existing closures or are we trying to suggest new areas? Aggregations of cod may be a more appropriate description.

Linda Mercer suggested that year one could be a high cost, wide area sampling effort to get broad coverage and then refine in later years.

The Committee agreed that the focus should be on mapping aggregations of cod - juvenile, spawning, feeding. An initial step would be to go port-to-port to identify an aggregation map and

then work on sampling. Information for the initial mapping effort could include: traditional knowledge, NMFS plankton survey, traditional cod maps, trawl survey, and bottom type maps.

From a statistical point of view, the effort should be more intense where things are most variable; trying to reduce variability. Where do you know you are going to find cod every year? Where do you think you may find them? Where do you never find cod? (Presence/Absence)

- Look at multiple sources to create map
- Weight sampling effort in the areas that are variable (always and sometimes)

The Committee discussed the various objectives of a cod distribution survey:

- Compliment NMFS survey to characterize cod distribution
- Fill in voids in time/space inherent in NMFS spring/fall survey and state surveys
- Enhance information used to identify fish habitat
- Enhance information on stock demographics – age structure – spawning condition
- Series of maps describing cod distribution in time/space by age structure/spawning condition/variance
- Identify areas of high variability
- Identify affiliation with other species in time and space
- Identify physical characteristics
  - Body shape? / color
  - Tissue samples?
  - Otolith geochemistry
  - Parasites
- Provide opportunities to collect, piggyback info (net temp., salinity, etc.)

\*\*\* Great opportunities for ancillary studies; make available to be funded elsewhere

Objective: Define broad scale distribution of cod in GOM (60 fathoms) in space/time by age/size/reproductive condition.

The above list of ‘objectives’ can be divided into the following categories:

Strategies:

Outcomes: the Committee needs to determine the level of resolution to be credible with managers and industry.

Products:

The Committee discussed the range that included Western GOM, and concluded on a definition of nearshore from latitude 41°30’ north.

**2) To assess the abundance, distribution and size composition of yellowtail flounder (and associated species) temporally and spatially within the NLS closed area, proposed closed areas and adjacent areas.**

The Management Council is discussing closing management areas # 84, 85, 84 for yellowtail flounder. After meeting with Rhode Island fishermen, the yellowtail study has been changed into a long-term survey and a short-term gear project. Industry meetings included discussions with NY and MA boats as well. April presented the Committee with a Rhode Island spring/fall survey of the southern New England yellowtail stock unit to determine age structure, maturity and distribution out to 40 fathom.

The NMFS has two cruises, one in the spring and the other in the fall (April and November). The Committee discussed whether it would make sense to have overlap with NMFS survey. The current NMFS proposal to NEC is to have the yellowtail survey after the NMFS trawl survey because the same NMFS staff would be used on both surveys. The NMFS proposal is to look at yellowtail distribution with respect to closed areas; a swept area biomass estimate (like Monkfish); an abundance estimate; and also a tagging study. NMFS' proposal uses two vessels to reduce calibration issues. The more vessels add more variability and the calibration issues can be time consuming. They are concerned about reaching the 75%/25% split required by NEC. The Committee agreed that a collaboration between the Rhode Island proposal and the NMFS proposal should be pursued.

Goal: Assess abundance, distribution and size composition of yellowtail flounder (and associated species) temporally and spatially in the Nantucket Lightship closed area, adjacent and potentially closed areas.

The Committee discussed the objectives of a yellowtail survey:

- Distribution vs. closed areas
- Swept area biomass – minimum estimate – consider this as a product of project
- Minimize calibration issues (by limiting the number of boats)
- Transfer to abundance?
- Tagging study
- Baseline of estimates in areas that may be closed
- Begin long term monitoring of recruitment, increasing the sampling when a large year-class is detected.

Area covered by the survey would be defined by:

- NMFS Trawl survey
- Industry advice
- Bottom type
- Plankton Tow

Survey Method:

- Grid? – when and where with respect to distribution
- Unequal probability sampling
- Large snap-shot, monitoring and then perhaps large snap-shot again

Timing:

- Simultaneous with NMFS survey?
- Overlap?
- Follow – to provide a more detailed view? The Committee determined that following the NMFS survey would be the best approach.

Vessels:

- two large vessels (over 80 feet) inter-calibrated
- one additional vessel for tagging

A study was completed in 1979 that should be reviewed by the sub-committee looking at yellowtail.

Potential Funding:

- NMFS Industry-based Survey
- Northeast Consortium
- NMFS Research Steering Committee
- Sale of Catch

April presented a second Rhode Island proposal for a short-term yellowtail industry need. This project would be a gear study to reduce by-catch and allow yellowtail fishing. Where you can go in time and space to avoid by-catch of yellowtail and whiting? Unless you can demonstrate less than 10% by-catch, you can't fish. Rhode Island is trying to maintain the small mesh fisheries. The project is a raised footrope trawl experiment and would result in a product in short term to share with industry and Congress.

The Committee agreed that the raised footrope experiment was an essential project to get funded, but there was mixed support for including this gear study in the Industry-based Survey Fleet. Like some other projects that the Committee had discussed, this gear experiment was not directly link to the over-arching goal of the IBS Committee and seen as ancillary. The Committee wanted it on the record that they do support this project and believe it is worthy of getting funding elsewhere as a gear study.

### **3) What is the relative abundance, temporal and spatial distribution of cod in the areas of the rolling closures?**

The Committee determined that this third question is no longer a focus. Rolling closures area not the appropriate place to put their efforts. Permanent closures, however, are an area that continue to deserve evaluation.

#### Cod Distribution Discussion (continued):

The Committee spent the remainder of the afternoon discussing the cod distribution survey in greater detail. The questions was raised "How open do we want to leave the cod distribution study for an abundance index?" i.e., if the survey is more broadly defined, it would easier to use the information as an abundance index after a series of years.

Do we want to design study to have a fine-scale distribution that will be useful for a relative abundance (which would be a broader study); or do we want to focus on more sampling fine scale? To index the whole area where the cod stock are found; you would need a broader survey.

Bob raised the issues of cost. As an example, the ME/NH inshore trawl survey costs roughly \$500-700 a station just for the boat and crew (not the scientific staff and analysis).

The Committee focused on when a survey would occur:

- Late March – early April – migrants and spawners (heaviest sampling in mid-coast)
- Late Sept/Early Oct.- juveniles and residents
- Late Feb - early March (heaviest sampling in south GOM)
- January – latest year class, less intensive sampling
- May-June (heaviest sampling downeast)

The Committee agreed the survey should be one shot for whole coast from Chatham to Penobscot Bay. With varied sampling - more intense in certain months and also in certain locations.

The cruise should be kept under three weeks (2-2 1/2 weeks?) with perhaps 3-4 boats. The more boats you use requires more calibration. Mike reminded the Committee that there needs to be time for side-by-side tows for calibration with each boat to each other.

The Committee also discussed gear requirements including what mesh would work best. An inch or two inch liner could be used if the Committee is not interested in the juveniles or first year recruits in January. The Committee will need to define criteria for the size of net; size of mesh; length of cable; and size of cookies (rollers) and performance standards. The use of inclinometer on boat to see when the net settles was also discussed although industry members stated that they know through other methods when the net is on bottom. Require net tending sensors on gear so you know boat is operating within standards?

It was suggested that the Committee look at Canadian boats for calibration issues. They have used a restrictor cable to reduce the variance among vessels. One Committee member also suggested the idea of calibrating an extra vessel to fill-in if one of the survey boats is inoperable.

#### Next Steps:

The Cod Distribution Sub-Committee and the Yellowtail Sub-Committee will each meet to work through the details of those two proposed surveys. A Draft Report will be circulated in February for review by the full Committee. **The FINAL Committee meeting will take place on March 6<sup>th</sup> in Boxboro at the Holiday Inn to review the Final Draft of the Report.**



**Industry-based Survey Committee  
Cod Sub-Committee Meeting  
January 30, 2002  
Holiday Inn, Boxboro, MA**

Attendance: Linda Mercer, Frank Mirachi, Kelo Pinkham, Bob Tetrault, Wendy Gabriel, Mike Fogarty, Chris Glass, Earl Meredith, Don Perkins, Laura Taylor Singer

The meeting began with a brief overview of the full IBS Committee meeting on January 10<sup>th</sup>. The IBS Committee decided to focus on two pilot projects – cod distribution in the Gulf of Maine and yellowtail assessment in southern New England. There are two sub-committees meeting at the end of January to work through the details of these pilot projects.

A draft document of the introduction to IBS Committee’s report with a section on the cod pilot project was distributed. It was noted that in addition to the sections presented, the final report will include a section at the end titled “Other Issues” to capture the many important discussion items that the IBS Committee covered. Current categories for this section include: Data Availability/Access; Local Knowledge; Permitting; Other Projects of Merit; Disposal of Catch.

The Cod Sub-Committee discussed the draft report and made suggestions to the background and introductory sections. The question was raised about the lack of common understanding of the term “Industry-based Survey”. Do we need to define industry-based survey? Instead of changing the name, the Cod Sub-Committee suggested adding a section to the Introduction that defines what is meant by an industry-based survey. Other suggestions made were to fit the current court events into the background as context; stress how useful this information will be to the current management issues confronting the region; and convey these efforts as collaborative to develop sustainable ways of fishing. The Introduction section should also keep focus on that fact that these are pilot projects and won’t be perfect on first year; this is the beginning of a process.

The Cod Sub-Committee agreed that the most important thing is to forge the partnerships with industry. NMFS doesn’t have the opportunity to focus on individual species and this gives them a chance to work in a focused way with industry and improve partnerships.

The Cod Sub-Committee talked about the need to improve the public’s perception of the fishing fleet and that collaborative research efforts need to be highlighted. Should public outreach be a part of the objectives? The industry-science partnership is the key focus so general public outreach may not rise to the same level as the other objectives in the report. However, the Cod Sub-Committee noted that there should be a common public outreach strategy for both study fleet and IBS work. Earl Meredith noted that NMFS might be hiring outreach person to do public outreach on collaborative research to fill this need.

There are three main audiences to focus outreach efforts: Industry, Congress and Environmental Organizations. The goal is to encourage public understanding of the work being done, forge partnerships with industry and break down barriers. Dealing with environmental groups early on to let them know what is going on and why would be critical to success of effort.

The Cod Sub-Committee reviewed the Goals, Objectives and Outcomes of the draft document section (see attached revised draft).

The Cod Sub-Committee focused on the draft Purpose and Deliverables of the Cod Pilot Survey. In the course of the discussion, it was noted that acoustic data should be the next level of effort to show what is happening in the water column, not just in the strata that is being sampled. IBS could begin to lay the groundwork for developing the information to get all cod within column...like herring initial projects.

Products from the Cod Pilot Survey would include the following:

- Raw data
- Distribution maps
- Fishermen's reports
  - Tows
  - Catch
- Length frequency
- Temperature
- Station location
- Video/photography

The Study Area for the Cod Pilot Survey was discussed. The area would include the Gulf of Maine up to a depth of 60 fathoms. The Cod Sub-Committee decided not to include Georges Bank as this increases the scope beyond a pilot, but justified coming down to 41'30 to get information on stock mixing and two stock theory. The Cod Sub-Committee debated how far east to take the survey. One suggestion was made to phase in Downeast area after pilot starts. Another suggestion was to incorporate Canadian summer trawl survey data?

The Cod Sub-Committee discussed several different time periods for the survey to take place. The Timing of the Cod Survey depends on what question the Sub-Committee is trying to answer: if it is purely aggregations, then we would do regularly spaced time frames; Are we trying to concentrate based on a series of assumptions about cod behavior or are we doing a more bi-monthly type of work. The timing was based on desire of industry to concentrate effort during times of year when the cod were aggregating. Focus on time/area closures so information would be useful to concentrate at those times.

The Cod Sub-Committee reviewed a Draft Budget prepared to serve as a starting place for the budget discussions. It was noted that the assumptions made in the budget are the following:

- One shoreside manager for the project
- Data housed somewhere else (NMFS or other agency)
- Vessel Charter costs include captain, crew, boat insurance
- Gear would be similar to that used in the ME/NH trawl survey; with restrictors like Canada

The Sub-Committee made the following additions/suggestions:

- Insurance to cover observers employer's risk - \$5,000
- Vessel insurance should be mandated in contract
- Data costs are low:

- Need data entry person or sub-contract
- Touch screen allowing on-board entry will happen eventually
- Training is needed for vessels and observers.
- Calibration (see discussion below)
- Funds for survival suits, boards, other observer equipment, etc.

The Cod Sub-Committee discussed calibration issues among vessels. The original intent was to try to do the survey in a synoptic way and reduce stress on vessels and crew. However, there is added uncertainty into the final product for each vessel used. The expenses also go up to do more calibrations among vessels. The discussion included separating the inshore portions of the survey with the offshore in the following way:

- Inshore: 5 stations with 2 crew; 7 stations with 3 crew; 2 fish counters for day trip.
- Offshore: 5 stations with 3 crew; 7 stations with 4 crew; round-the-clock; 2 and 2 fish counters.

The limiting factor for each station is how long it takes to count the fish coming overboard. Separating into 2 inshore vessels and 2 offshore vessels was discussed, however the Cod Sub-Committee preferred one class of vessels doing both inshore and offshore work for calibration issues. Similar size vessels would give lower variability. The Cod Sub-Committee decided on having one vessel class that can do both inshore and offshore work; 50 – 65 foot vessels that has a standard net design and a long-term commitment would be key.

50 tows to calibrate between two vessels (minimum)

5 tows/day = ten days that you would have to devote to calibration for the year

10 tows/ 5 cruises which is 2 days per cruise devoted to calibration

The Sub-Committee discussed how to work toward removing the impacts of each vessel: size, tonnage, gear, and wheelhouse factor.

Potential Criteria for Boats:

- Tonnage
- Length
- # Crew – 1 captain and 2 crew
- # Berths (6)

The Cod Sub-Committee discussed the Survey Design, starting with concept of “weighting” samples in areas where you are more likely to find cod. One suggestion was to allocate the first year in a standard fashion and then perhaps distribute samples in year two in a non-proportional allocation. The industry members would like to use what we already know and weight sampling in areas that are in need of greater attention/scrutiny. Although there is a desire to have broad coverage in the area overall, the survey can have more samples where there is higher catches and higher variability. One suggestion was to have more calibration tows in the areas where the most samples are needed (i.e., right after the calibration side-by-side and then additional samples steaming to next strata).

The Sub-Committee discussed when to carry out the survey. There were six different times under consideration in order to capture the aggregations (spawning, juveniles) of fish when they occur; higher catch per unit effort at these times

- January – latest year class, less intensive sampling
- Late Feb - early March (heaviest sampling in south GOM)
- Late March – early April – migrants and spawners (heaviest sampling in mid-coast)
- May-June (heaviest sampling downeast)
- Late Sept/Early Oct.- juveniles and residents
- Nov/Dec.

With 4 boats surveying 10 days each with 5 stations per day = 200 samples for each time period for a total of 1200 station per year. This would require a lot of effort and sampling throughout the year. Ideally, the Sub-Committee would want to sample at all six times of the year. We could make the case that we want to over-sample the first year and have a high budget and then reduce sampling (and cost) in years two or three. The Sub-Committee discussed various options (below) for reducing the number of samples.

*Option 1:* All 6 times at 50% sampling – Idea of a robust survey the first year which can test assumptions and modify survey in the second year (robust defined as minimizing and being able to describe variability and assumptions). Looking at distribution across all temporal and spatial cells; could go back with more robust sampling. (100 stations per time period for a total of 600)

*Option 2:* Sampling throughout entire area to get broad overview --- March and April/May and Oct/Nov – complements NMFS survey and focused on where industry wants to go; would be criticized by industry for not doing this ‘political reality’; from a show results point of view, could start this option earlier; compromise between getting information in rolling closure and getting some information from the fall (200 stations per time period)

*Option 3:* If focus on rolling closure times – high resolution product in a distinct time period -- Feb/March; March/April, and April/May; If you want to focus on management question this is the when the aggregations occur and avoid fixed gear (200 stations per time period)

*Option 4:* Get a fall snapshot and richer coverage in the spring; Feb/March; March/April, and April/May and Oct/Nov (150 stations per time period)\*\*\*

The Cod Sub-Committee determined that Option 4 would be the preferred option if all six times could not be sampled.

Finally, the Sub-Committee discussed Project Management. The Study Fleet is looking at private contractors to work with vessels on trouble-shooting with technology as well as with NMFS field staff for biological sampling and shoreside vessel logistics. The IBS Cod Pilot Survey can be organized with one organization at the state/regional level. However, the Sub-Committee stressed the need to contact people in regions to work through details at the local level with communities to plan and communicate. One suggestion was to establish an industry advisory board with states, industry, vessels and science. The Advisory Board may be convened through a common training technique. Local meetings will also be necessary before tows take place for tow advice and fixed gear issues.

**Industry-based Survey Committee  
Yellowtail Sub-Committee Meeting  
January 31, 2002  
Northeast Fisheries Science Center, Woods Hole, MA**

Attendance: Wendy Gabriel, Mike Fogarty, April Valliere, Fred Mattera, Brian Murphy, Steve Murawski, Steve Cadrin, Frank Almeida, Chris Legault, Mark Terceino, Laura Taylor Singer, Pat Foote

Wendy Gabriel opened the meeting and explained that Rhode Island (through the Industry-based Survey Committee) and the Northeast Fisheries Science Center staff had independently developed preliminary proposals to address yellowtail flounder information needs in southern New England. This meeting was held to discuss how to merge those two proposal concepts into a cooperative proposal to be included as a pilot project for consideration by the Industry-based Survey Committee.

Laura Taylor Singer provided a brief update of the Industry-based Survey Committee (IBS Committee). The Industry-based Survey Committee includes federal and state fisheries scientists, managers, and fishermen from Maine, New Hampshire, Massachusetts, and Rhode Island. The IBS Committee has met four times since August 2001, discussing many issues related to industry-based research such as vessel management, data collection and analysis and public relations. At the most recent meeting on January 10<sup>th</sup>, the IBS Committee decided to focus on two pilot projects – cod distribution in the Gulf of Maine and yellowtail assessment in southern New England. There are two sub-committees meeting at the end of January to work through the details of these pilot projects. It was also noted that the NMFS Cooperative Research Office is looking at a public outreach position to insure public awareness about the cooperative research happening in New England.

The Yellowtail Sub-Committee (YT Sub-Committee) discussed the objectives of a yellowtail survey as outlined in the IBS draft report (see attached). The YT Sub-Committee emphasized that the yellowtail assessment effort should lend to the overall assessment process and not be a competing assessment with the current NMFS survey. A short-term survey would provide useful information, but a long-term assessment is preferred. The pilot project could anchor the current assessment with a swept area biomass by producing a fixed datapoint to use as a reference.

The YT survey objectives need to define adjacent areas because there is little information about the boundaries between southern New England and Mid-Atlantic yellowtail. The YT Sub-Committee would endorse expanding the areas and including age composition and size composition as demographics.

The YT Sub-Committee also discussed the various issues relating to calibration among more than one fishing vessel. Some calibration of vessel efficiency is needed. Equipping each vessel with the same gear to insure less variability may be one option. The project budget should include funds for time and cost to calibrate; may take 50 tows to establish calibration. The monkfish survey calibrated in three different ways: 1) side-by-side (~16 tows); 2) same stations (at different times); and 3) depletion studies (key to Monkfish project).

Sensors/cameras may help reduce number of tows as long as both vessels have identical sensing equipment. The vessels need to be as identical as possible in gear, as well as personnel, skill level to keep the variability low. It was also noted that the cost goes up with each additional vessel that needs to be calibrated.

#### YT Objective:

To assess the abundance, distribution, movement patterns and size/age composition of yellowtail (and associated species) temporally and spatially within the Nantucket Lightship closed area, proposed closed areas and adjacent areas.

The YT Sub-Committee discussed the need for including a tagging study within the yellowtail pilot project proposal for the IBS Committee. Although stock tagging may not need to be a part of the IBS study; it could be integrated in to the survey. Archival tags may shed light on habitat – temp, time, pressure, etc. Tagging may be short tows, different from the survey and may cause inefficiency within the survey. The survey may offer opportunity to recapture same animals for tagging study. The YT Sub-Committee determined that each project (yellowtail survey and yellowtail tagging) complement the other and should be included in the same package. It was decided that the tagging description should be included as a bullet in the project purpose and a deliverable bullet that speaks to the longevity of the data coming in from the tagging (10+ years). The need for web-based data, including GIS info/view on tag returns was also discussed.

The YT Sub-Committee discussed the Purposes of the yellowtail stock assessment as outlined in draft form and made the following additions:

#### YT Purpose:

##### New Bullet:

- To provide swept area biomass accounting for efficiency.
- To evaluate general patterns of movement and factors (temperature, depth) associated with yellowtail movements, including movement between adjacent putative stock areas and in and out of the Nantucket Lightship closed area.

The YT Sub-Committee also suggested that the swept area biomass listed as a deliverable should be the estimate number (confidence) and include its variance.

#### YT Deliverables:

##### New Bullets:

- Tagging/recapture information over a longer period of time.
- Estimate of yellowtail biomass and variance with confidence limits.

The YT Sub-Committee spent the remainder of the afternoon discussing the study design for a yellowtail survey and for a yellowtail tagging effort in southern New England. A draft budget was provided to serve as a reference point for the discussion. It was noted that the draft budget does not include the additional tagging project proposed in the NMFS proposal which would include an separate vessel for tagging and cost of tags (tags can cost from \$17 to \$200).

Insurance for the observers and the vessel was discussed as an additional budget item that should be included in the observer rate. One suggestion was to write up vessel insurance to cover observers instead – put it in bid or write into the vessel contract. Another possibly is to investigate getting group coverage for observers and take the burden off the vessel insurance to avoid any “blemish” on vessel insurance record. It was noted that insurance coverage is needed for both the employer of the observer and the vessel owner to insure against any claims.

The YT Sub-Committee discussed if there could be a mechanism to keep/sell fish to replenish project funds, though the issue was not resolved. The monkfish project did not charge the vessels for a fishing day because they were being contracted for scientific work. However, the catch was not allowed to be sold and had to go overboard.

#### YT Survey Study Design:

The YT Sub-Committee agreed on the need to establish with fishermen information and insight into the description and criteria of the tows. Fishermen’s knowledge about the strata will be key to the success of the pilot project.

- Mixed Sampling:
  - Random stratified (strata to be determined through workshop with fishermen to identify coordinates) (~ 50%)
  - Fishermen Identified Sites (~50%)  
(Partly industry selected stations and partly stratified-random; percentages to be negotiated. Again, discuss locations/grids/plots, etc. with the fishermen who know, through workshop.)
- Statistical areas 526/539/537/611/613/616 not to exceed 50 fathoms
- Stay with April/November
- 1/2 hour tows; roughly 10 tows per day.

The YT Sub-Committee discussed how dense the tows would need to be to sufficiently cover the area. It was determined that the pilot project should over sample the first year and then re-assess the number of stations needed for the second year. Additional tows will also be needed for calibration and unanticipated stations. The YT Sub-Committee agreed on the following:

- 100 tows/vessel/season = 200 tows/season or 400 tows/year or 40 days/vessel
- 50 tows/vessel/season as extra tows for calibration and depletion studies
- Total = 150 tows per vessel/season (average 10 tows per day)

40 days/year/vessel (20 days/season)  
+ 20 days/ year (10 days/season) for calibration, etc.  
60 days/ year (30 per season)

\*\*15 days per vessel for each season

The YT Sub-Committee also noted that fixed gear will be a concern and someone should talk to Bonnie Spinazzola (Atlantic Offshore Lobstermen’s Association) for communication and coordination.

*Preliminary Vessel Criteria:*

- Size – minimum 80 feet
  - o 1 captain/ 2 crew minimum
  - o 1 captain/ 3 crew for a 24 hour day
- Bunks – six
- Deck space
- Sensors
- Experience – documented landings history with local experience
- Paired vessels?
- Vessel supplies standardized gear in bid

The Sub-Committee discussed the number of scientists and observer staff aboard the vessel needed to process the amount of fish being caught. Based on experience, a minimum of 5 staff would be needed for a 24 hour day. However, the Sub-Committee believed the work could be accomplished with a partial day and therefore only 3-4 staff would be needed to process the samples.

The Sub-Committee continued to review the draft budget for both proposed projects (yellowtail survey and yellowtail tagging) and determined the following:

YT Survey Budget:

Gear:

- Vessel supplies standard gear in bid for contract (not part of direct project cost)
- Project supplies 2-31/2 inch cod end liners; 3 per vessel at \$1500 each = \$4,500
- Or, in other words, budget for gear - webbing, liner, gear maintenance, \$6,000 per boat

Equipment:

- Scales to weigh fish -\$10,000/vessel (first year expense only)
- (Investigate if there are other projects (cod survey?) that can lend scales)
- Other disposable items budget - \$1,000/year
- Gear Sensors – inclinometer?
- Temperature Sensors? (borrowed?)

Staff:

- Add Technician - Sample analysis for aging yellowtail and cod (i.e. share with cod pilot project)- \$40,000 (including benefits)

Refer back to original budget to pick up miscellaneous items and increase the budget for travel as communication and outreach travel will be important.

YT Tagging Budget:

Staff:

- Project Manager, data analyst could also serve the tagging project.
- 2 observers (the cod project tagged 1,000 fish/day with 4 people)

Two people (Project Manager and Data Analyst/Data Entry) could handle the whole management process of both the yellowtail survey and tagging projects. The Sub-Committee also discussed where the project management should happen. The broader IBS Committee has been



discussing the need to keep the project management decentralized and within the states and this approach of contracting to a state agency or other regional organization was supported by the YT Sub-Committee. These two positions could also add the project outreach as well and coordinate with the efforts being proposed by the NMFS Cooperative Programs Office. They may also offset the observer costs by filling in on that role as well.

#### Tags:

The Sub-Committee also discussed how to provide incentives for returning tags. Maybe a sliding scale for info accompanying the tag; or have a lottery to pick a tag and give the fisherman a \$1000. Public recognition was also seen as an incentive for some folks. At the very least, the fishermen need to receive an annual report of the tagging results. Archival tags should probably each have an attached reward because they are so expensive to replace. (100 archival tags will be used in the project.)

- Tag Return Incentives:
  - Lottery - \$1,000 per year
  - Archival tags - \$50 per tag
  - Industry public recognition
  - Outreach – newsletter
  - Annual YT tag report (see NEA cod tagging suggestions)

(Additional expenses for tagging will come from original spreadsheet supplied by NMFS Center staff in their proposal to NEC.)

#### Vessel:

- 1 vessel (1 captain/ 2 crew)
- 28 days/ year @ \$4,000 per day (or less?)
- Vessel size: 60' to 70'
- Vessel should be equipped with a flatfish net. Specialized gear is not necessary.
- Laptop computer
- See NEC/NMFS budget (\$65,000 for tags)

The Sub-Committee discussed the need to begin project planning and further discussions with the industry ASAP. The next step in the IBS Committee process will be to draft two pilot projects to be included in the final report and get the Committee's feedback and revisions prior to the final IBS Committee meeting on March 6.

**Industry-based Survey Fleet Committee**  
**March 28, 2002**  
**Holiday Inn, Foxboro, MA**

Committee Members Attending:

Mike Fogarty, National Marine Fisheries Service, Science Center; Fred Mattera, West Kingston, RI; Linda Mercer, Maine Department of Marine Resources; Earl Meredith, National Marine Fisheries Service, Cooperative Research; Frank Mirarchi, Scituate, MA; Cheri Patterson, NH Fish and Game Department; Liz Rowell, Charlestown, RI; and April Valliere, RI Division of Fish and Wildlife. Staff: Don Perkins and Laura Taylor Singer, Gulf of Maine Aquarium.

Don Perkins opened the meeting with a round of introductions. He presented an overview of the draft agenda for the day (see attached) and solicited ideas for additional agenda items.

NMFS Update and Overarching IBS Budget Issues:

The Research Steering Committee met this week to review two RFP's. One is for Cod Tagging work (\$1.5 million per year for two years) and the second is for Conservation Engineering projects (up to \$2 million). The Study Fleet money is being used to address technology infrastructure needs.

Earl Meredith gave an overview of the budget process and the potential funding allocated to the Industry-based Survey effort. The Regional Office spending plan includes \$1.7 million budgeted for the Industry-based Survey in FY02 (ending 9/30/02) and an additional \$ 1.7 million in FY03 (10/1/02 – 9/30/03). The final report from the Committee will be presented to the Regional Administrator (RA) for her review of IBS recommendations. The more cohesive the report, the easier and faster the process will be at the Regional Office level. Allocation of IBS resources will be at the discretion of the RA, so the more guidance the report can provide, the more predictable the outcome. The report will also be sent to the Research Steering Committee for their informal review and comments. After approval by the RA, a request for proposals will be submitted, probably through Commerce Business Daily.

The IBS Committee questioned whether they needed to have consensus on a report that has a \$1.7 million budget or should the report reflect IBS needs regardless of the budget constraints. Linda Mercer recommended looking at a two year \$3.4 million budget. The IBS Committee was reminded by Earl that this is a pilot project for two years before launching into a longer term effort. April Valliere advocated for staying with the original objectives as written, regardless of the budget. There was a discussion about the likelihood of second year funding and the responsibility of the IBS Committee to come up with a report that is within the budget allocation. The Committee came to agreement to try to fit both projects into a \$3.4 million budget over two years.

There will be two contracts let following a RFP for project implementation for the cod work and the yellowtail work. April and Fred Mattera have already identified vessels that fit criteria for the Southern New England yellowtail project. They raised concerns about going to bid after a contractor for implementation is identified. If you go out to bid, who will evaluate the vessel

criteria? They advocated for the vessels to be identified prior to the RFP bid process. Earl stated that he would like vessels pre-identified in the proposal, but would like a policy about how vessels are recruited for the project bid. Don Perkins noted that some projects have successfully recruited vessels by competitive RFP following funding approval, and that such a process can result in expanded vessel participation beyond the more experienced collaborative research participants. The IBS Committee discussed how to solicit vessels and at what stage in the process (before or after the RFP). There needs to be a pool of vessels that can bid for this work with documented criteria. It was clear that different collaborative research projects and different regions may require a different process. The key component is to have clear evaluation criteria. Rhode Island can justify recommendations for vessels already determined.

Frank Mirarchi suggested that the crews and captains that don't get selected for the Industry-based Survey work be used on the vessels as industry experts.

#### Data Management:

The IBS Committee has advocated for rapid turn around of the data and therefore the need for some type of reporting mechanism. Mike Fogarty pointed out the NMFS compiles a Fishermen's Report after each cruise so there is already a precedent set for information to the community about the survey. However, it was noted that this is only in hard copy and sometimes difficult to access. The Data Sub-Committee suggested creating a web-based user interface to access the most commonly asked questions about the data. Some type of web page in GIS format with stations that could be clicked upon for individual tow snap-shots of the cruise was discussed. The question was raised whether the internet is the correct venue for the information. Would you need a hard copy as well? The IBS Committee agreed that a third party IBS web page was desirable and that ultimately NMFS should archive and quality control the data.

The IBS Committee agreed that it is good to see what is going on out on the water in a quick turnaround. An easily accessible site is a good tool to gain support for the industry-base survey. The IBS Committee debated how to monitor the data for misinterpretation. However, it was noted that any data can be used in the public arena for advocating someone's position. April suggested a chat room to discuss implications of results may be helpful. The SAW review happens twice per year and perhaps they could review results at this point?

Would the IBS Implementation Committee have some oversight of data management and web publication? What are the parameters and context on how to interpret? The Committee recommended that GMA refine this section further in the report to reflect the Committee's concerns that facts be used responsibly and to provide context for interpreting early released IBS information.

The IBS Committee reviewed the design of the Implementation Committee (page 8 of the draft). It was unanimous that one committee should be designed to oversee both the SNE yellowtail and GOM cod projects. This would allow discussions between SNE and GOM. The initial effort is a pilot that is concentrated on these two priority needs, but the Implementation Committee should be looking over the horizon at different issues as well for the long-term IBS program.

### Other Issues:

The IBS Committee discussed Vessel Compensation and Disposal of Catch (page 7 of draft report). There was concern raised about the definition of a day and compensation. If the vessel is offshore and the weather turns bad, the SNE yellowtail fishermen would need to be compensated for day. The GOM cod vessels are more day boats. Ultimate responsibility for the safety of the crew and vessel is with the captain. GMA agreed to re-write this section for the final report.

The IBS Committee asked for clarification of observers – who are they and what do they do? Observers are typically scientists with research vessel experience and perhaps some fishing vessels experience as well. The observer tasks involved on the vessel need to be clarified in the final report.

The IBS Committee also discussed the need to elaborate on the disposal of catch and advocated for a policy to allow the catch to be kept and sold with the funds going back to the project. This work should not count as a day at sea.

### SNE Yellowtail Issues:

April presented a revised budget that increases the cost of the SNE yellowtail project by approximately \$ 215,000 to roughly \$ 930,000. The increases were primarily in the vessel costs after discussion with the industry and setting aside a contingency fund for gear. The gear for the project would be provided by the industry, but it was suggested that a modest contingency fund be established for replacing the gear if it is lost or damaged.

### GOM Cod Issues:

Based on the NH/ME inshore trawl survey results, the IBS Committee determined that the cod survey should extend east to the Hague line and out to 60 fathoms. The survey strata should be defined by the industry, perhaps by bottom type or areas of historically high catches. The suggestion was made to use the cod survey to cover areas that aren't being covered by NMFS and states to fill in the gaps. More effort should be put into areas that aren't being covered, but the whole area will still need to be covered to analyze the results properly for distribution.

The IBS Committee agreed that the cod survey should happen five times/year to capture both rolling closures and cod movement.

### Budget Discussion:

The Cod Sub-Committee had two alternative sampling designs based upon funds available. The IBS Committee discussed whether or not to reduce the overall budget to fit \$ 1.7 million in year one. April advocated for putting into the report what was needed to cover both projects and look at a \$ 3.4 million budget over 2 years. The SNE yellowtail project did not design any alternatives because that would provide an option to reduce funding. Instead, they voiced skepticism over the \$ 1.7 million figure for year one and promoted going forward with whatever the projects needed to meet the objectives. It was suggested by some Committee members, however, that the number of stations for the projects could be reduced or perhaps the NMFS Cod

Tagging project could pick up the yellowtail tagging study. It was also suggested that some of the durables purchased in year one would not need to be purchased in year two so the two year budget may work. The IBS Committee decided not to present alternative budgets in the report because there was no consensus on how to reach a final budget figure. GMA was instructed to prepare a full budget for both projects with expenditures projected as expected to occur over a two year period and forward such a budget to Committee members to discuss implications.